Vol. 1040 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced at 1039 O.G. 142 on Feb. 21, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Jan. 30, 1984. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,645,835, Re. S.N. 570,011, Filed Jan. 11, 1984, Cl. 428/195, MOISTURE-VAPOR-PERMEABLE PRESSURE SENSITIVE ADHESIVE, Martin E. Hodgen, Owner of Record: *T. J. Smith & Nephew Ltd., Kington-Upon-Hull, England,* Attorney or Agent: Albert L. Jacobs, Ex. Gp.: 164

4,308,672, Re. S.N. 567,398, Filed Dec. 30, 1983, Cl. 36/50, ADJUSTABLE AND FLEXIBLE CLOSURE ASSEMBLY FOR SHOES WITH VARIABLE OPENING, Anthony J. Antonious, Owner of Record: *Inventor,* Attorney or Agent: Douglas B. Henderson, Ex. Gp.: 353

4,379,464, Re. S.N. 570,719, Filed Jan. 13, 1984, Cl. 131/84, COOKED FLAVORS FOR SMOKING PRODUCTS, Louise Wu., et al., Owner of Record: *Philip Morris, Inc., New York, N.Y.,* Attorney or Agent: George E. Inskeep, et al., Ex. Gp.: 335

4,394,464, Re. S.N. 565,574, Filed Dec. 27, 1983, Cl. 52.1/18D, MODIFIED POLYIMIDE FOAMS AND METHODS OF MAKING SAME, John Gagliani, et al., Owner of Record: *Inventor,* Attorney or Agent: Frank D. Gilliam, Ex. Gp.: 143

4,417,029, Re. S.N. 570,567, Filed Jan. 13, 1984, Cl. 525/314, DERIVATIZATION OF STAR-BLOCK COPOLYMERS, Ralph Milkovich, Owner of Record: *Atlantic Richfield Co., Los Angeles, Calif.,* Attorney or Agent: L. J. Young, et al., Ex. Gp.: 144

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,910,349, Reexam. No. 90/000,497, Requested: Feb. 6, 1984, Cl. 166/153, APPARATUS AND METHOD FOR CEMENTING WALL LINERS, Joe R. Brown, et al., Owner of Record: *Hughes Tool Co., Houston, Tex.,* Attorney or Agent: Robert A. Felsman, Ex. Gp.: 350, Requester: Otis Engineering Corp., Dallas, Tex.

3,963,178, Reexam. No. 90/000,501, Requested: Feb. 15, 1984, Cl. 239/8, SPRAYER NOZZLE, Dean E. Collins, Owner of Record: *Root-Lowell Manufacturing Co., Lowell, Mich.,* Attorney or Agent: Oltsch & Knoblock, Ex. Gp.: 310, Requester: B & G Equipment Co., Plumsteadville, Pa.

4,146,793, Reexam. No. 90/000,505, Requested: Feb. 15, 1984, Cl. 250/444, X-RAY DEVICES USING EPOXY RESINS STRENGHTENED WITH CARBONIC FIBROUS MATERIALS, Lennart Bergstrom, et al., Owner of Record: *Siemens AG, Munchen, Germany,* Attorney or Agent: Hill, van Santen, et al., Ex. Gp.: 250, Requester: Owner

4,249,281, Reexam. No. 90/000,495, Requested: Jan. 31, 1984, Cl. 15/340, SELF-PROPELLED VACUUM CLEANER, Robert B. Meyer, et al., Owner of Record: *National Union Electric Corp., Greenwich, Conn.,* Attorney or Agent: Alfred E. Miller, Ex. Gp.: 240, Requester: Owner

4,288,965, Reexam. No. 90/000,506, Requested: Feb. 17, 1984, Cl. 53/451, FORM-FILL-SEAL PACKAGING METHOD AND APPARATUS, Robert C. James, Owner of Record: *Hayssen Manufacturing Co., Sheboygan, Wis.,* Attorney or Agent: Senniger, Powers, et al., Ex. Gp.: 171, Requester: Hayssen Manufacturing Co., St. Louis, Mo.

4,305,091, Reexam. No. 90/000,504, Requested: Feb. 15, 1984, Cl. 358/036, ELECTRONIC NOISE REDUCING APPARATUS AND METHOD, J. Carl Cooper, Owner of Record: *Inventor,* Attorney or Agent: Charles R. Rust, Ex. Gp.: 231, Requester: Harris Corp., Melbourne, Fla.

4,372,974, Reexam. No. 90/000,508, Requested: Feb. 21, 1984, Cl. 424/319, ANTICONVULSIVE COMPOSITIONS AND METHOD OF TREATING CONVULSIVE DISORDERS, Irving Fish, et al., Owner of Record: *New York University, New York, N.Y.,* Attorney or Agent: Darby & Darby, Ex. Gp.: 123, Requester: Owner

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Errata

"All reference to Patent No. 4,406,092 to Charles W. Lake et al. of Okla. for 'SURFACE CLEANING

MACHINE' appearing in the Official Gazette of Sept. 27, 1983 should be deleted since no patent was granted."

"All reference to Patent No. 4,428,446 to Akira Kimura et al. of Japan for 'MOTOR VEHICLE EQUIPPED WITH ENGINE NOISE EMISSION PREVENTING DEVICE' appearing in the Official Gazette of Jan. 31, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,431,694 to John T. Balkwill of Calif. for 'MULTIFIBER DESIGN FOR MICROCHANNEL PLATES' appearing in the Official Gazette of Feb. 14, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,433,074 to David H. Hawes of S.C. for 'DISCONTINUOUS FIBER PRETREATMENT' appearing in the Official Gazette of Feb. 21, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,433,101 to William H. Gibby, Jr. of N.J. for 'BLENDS OF VINYL HALIDE-POLYLEFIN GRAFT COPOLYMERS AND ABS POLYMERS' appearing in the Official Gazette of Feb. 21, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,433,169 to Hans-Joachim Scholl of Germany for 'DIAMINES AND A PROCESS FOR THEIR PREPARATION' appearing in the Official Gazette of Feb. 21, 1984 should be deleted since no patent was granted."

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,355,944, Anatole J. Sipin, MASS FLOW METERING MEANS; **3,485,098, same; 4,187,721,** James E. Smith, METHOD AND STRUCTURE FOR FLOW MEASUREMENT, **filed** Sept. 1, 1982, D.C., S.D.N.Y., Doc. 82-Civ-5796, *Micro Motion, Inc.* v. *Anatole J. Sipin Co., Inc.*

3,485,098. (See 3,355,944.)

3,807,713, Respiratory Care, Inc., BOTTLE CONTAINING FLUID FOR INHALATION THERAPY APPARATUS; **3,864,544, same,** ELECTRIC HEATING UNIT FOR LIQUID; **3,903,216, same,** INHALATION THERAPY APPARATUS; **3,915,386, same,** NEBULIZER; **4,187,951, same,** BLOW MOLDED BOTTLE WITH DIFFUSER AND METHOD FOR MAKING SAME; **4,217,328, same,** METHOD OF BLOW MOLDING A BOTTLE WITH A DIFFUSER; **D. 257,763, same,** BOTTLE, **filed** July 23, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 4575, *Respiratory Care, Inc.* v. *Walter G. Cornett, III, et al.*

3,864,544. (See 3,807,713.)

3,903,216. (See 3,807,713.)

3,915,386. (See 3,807,713.)

4,070,563, Peter D. Petroff, INFILTRATION-INFLOW SEWER LINE ANALYZER; **4,211,111, same,** filed July 2, 1981, D.C., W.D.N.C. (Charlotte), Doc. C-C-81-0265, *Condor Systems, Inc., et al.* v. *Environmental Leasing, Inc., et al.*

4,100,997, Bobbie D. Peacock, STEP CONSTRUCTION EMPLOYING INSERTABLE FASTENER HAVING DEFORMABLE PROJECTIONS, **filed** Oct. 6, 1983, D.C., W.D. Mo. (Kansas City), Doc. 83-1107-CV-W-6, *M. A. Industries, Inc.* v. *Clay and Bailey Mfg. Co.*

4,103,860, Haas and Schenken, MIRROR HOLDER, **filed** June 8, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 2865, *Cobbs Mfg. Co.* v. *Hollywood Accessories Co., et al.* Plaintiff's Notice of Stipulation dismissing action with prejudice entered on June 28, 1983.

4,109,343, Weis and Vander Meulen, TROLLEY WHEEL ASSEMBLY, **filed** Aug. 22, 1983, D.C., N.D. Ga. (Atlanta), Doc. C83-1752A, *C. L. Frost & Son, Inc.* v. *Tri-II, Inc.*

4,109,437, Player and Barton, BUILDING PANEL, **filed** Dec. 30, 1983, D.C., N.D. Tex. (Dallas), Doc. 3-83-2305 G, *Howmet Aluminum Corp.* v. *Mason Corp.*

4,114,804, Jones and Sherman, COUNTERFEIT DETECTION MEANS FOR PAPER COUNTING, **filed** Dec. 15, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 6989, *Brandt, Inc.* v. *William Crane, doing business as Money Processing Consultants.* **Same, filed** Mar. 9, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 1159, *Billcon International, Inc.* v. *Brandt, Inc., et al.*

4,131,195, Scott Paper Co., DISPOSABLE, COMPACTABLE MOISTURE IMPERVIOUS PACKAGE FOR PREMOISTENED SHEETS, **filed** Sept. 30, 1983, D.C. Del. (Wilmington), Doc. 83-649, *Scott Paper Co.* v. *Riegel Textile Corp.*

4,133,919, Robert C. Parsons, METHOD OF MAKING DECORATIVE PANELS, **filed** Oct. 19, 1983, D.C., N.D. Tex. (Dallas), Doc. CA3-83-1783-C, *Joe F. Miller* v. *Raid Parker and Cynthia Parker, doing business as Glass Etch Design.*

4,144,594, Melvin H. Chapman, FILIGREED BELT AND METHOD OF MAKING SAME, **filed** Oct. 23, 1981, D.C., W.D. Okla. (Oklahoma City), Doc. CIV-81-1472-W, *Amsco Corp.* v. *Nocona Belt Co.* Judgment by default that all claims of Pat. No. 4,144,594 are invalid and unenforceable. Pat. No. 4,114,594 is not infringed by the manufacture, use or sale of plaintiff's belts. Filed Apr. 19, 1982.

4,147,896, Cannon and O'Neill, FIXED SPEECH BUFFER MEMORIES FOR SIGNALLING WITHOUT AN ORDER WIRE, **filed** Dec. 6, 1983, D.C., M.D. Fla. (Orlando), Doc. 83-966-CIV-ORL-11, *Comtech Communications Corp.* v. *Electronics Corp. of Israel Ltd., et al.*

4,172,359, Haas and Schenken, TIMEPIECE WITH ELECTRONIC CHIME GENERATOR, **filed** Aug. 10, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-3874, *Drugor Associates* v. *Franz Hermle & Sohn, et al.*

4,173,910, Lineberry, Buckner and Harris, METHOD AND APPARATUS FOR HANDLING BRICK, **filed** Apr. 20, 1981, D.C., M.D.N.C. (Greensboro), Doc. C-81-172-G, *Auto-Systems and Service, Inc.* v. *Clarksville Machine Works, Inc.* Stipulation of Dismissal with prejudice filed by Plaintiff on Dec. 1, 1981.

4,175,923, William G. Friend, METHOD AND APPARATUS FOR OCCULT BLOOD TESTING IN THE HOME, **filed** Nov. 28, 1983, D.C.N.J. (Newark), Doc. 83-4536D, *Warner-Lambert Co.* v. *C. B. Fleet Co., Inc.*

4,184,429, Max Widmer, CONSTANT BEVEL DOCTOR BLADE AND METHOD AND APPARATUS USING SAME, **filed** Oct. 26, 1982, D.C., E.D. Pa. (Philadelphia), Doc. 82-4712, *Max Daetwyler Corp.* v. *R. Meyer.*

4,187,721. (See 3,355,944.)

4,187,951. (See 3,807,713.)

4,188,825, James G. Farrar, MONITOR FOR DIVERS TO AVOID DECOMPRESSION, **filed** Nov. 25, 1983, D.C., S.D. Fla. (Miami), Doc. 83-6834-CIV-JLK, *Aquatechnology, Inc.* v. *Divers Unlimited, Inc.*

4,189,664, Richard L. Hirschfeld, POWER CONTROL UNIT FOR AUTOMATIC CONTROL OF POWER CONSUMPTION IN A LIGHTING LOAD, **filed** Sept. 13, 1983, D.C., S.D. Ohio (Dayton), Doc. 3-83-956, *Voltage Control Corp.* v. *Staco Powernetics, Inc.*

4,191,590, John J. Sundheim, METHOD AND APPARATUS FOR CLEANING CARPETS AND

SURFACES USING CLEANING FLUID, **filed** Sept. 16, 1983, D.C. Ore. (Eugene), Doc. 83-6416-E, *Windsor Industries, Inc., et al.* v. *Arnold E. Ballweber, doing business as Ballweber Industries.* Defendants are permanently enjoined from further infringing U.S. Pat. No. 4,191,590 per Consent Decree and Judgment filed Dec. 21, 1983.

4,195,330, John M. Savage, Jr., LENS CLIP AND CAP FOR LED OR LIGHT UNIT ASSEMBLY, **filed** Nov. 12, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5845, *Visual Communications Co., Inc.* v. *Data Display Products, et al.* Order and Consent Judgment entered June 27, 1983.

4,205,780, Burns and Ho, DOCUMENT PROCESSING SYSTEM AND METHOD, **filed** Dec. 23, 1982, D.C., N.D. Tex. (Dallas), Doc. CA3-82-2135-H, *Banctec, Inc.* v. *ROI Consulting, Inc.*

4,207,087, Morrison & Baer, MICROCOMPUTER CONTROLLED GAME, **filed** Mar. 5, 1981, D.C., S.D.N.Y., Doc. 81-Civ-1288, *Milton Bradley Co.* v. *Kingsford Ltd., et al.* Defendants are permanently enjoined from infringing Pat. No. 4,207,087 per Judgment entered Dec. 17, 1981.

4,211,111. (See 4,070,563.)

4,213,028, Arend Wolf, ELECTRIC HEATING DEVICE FOR VEHICLE WINDOWS, **filed** Dec. 5, 1983, D.C., N.D. Ohio (Toledo), Doc. 83-1097, *Audiovox Corp.* v. *Dana Corp.*

4,217,328. (See 3,807,713.)

4,229,211, Donald D. Battles, LADLE HEATING SYSTEM, **filed** Sept. 19, 1983, D.C., E.D. Ky. (Lexington), Doc. 83-300, *Thermecon, Inc.* v. *Hotwork Mfg. Co., Inc., et al.*

4,249,734, Eric Bromley, HAND-HELD TWO-PLAYER ELECTRONIC FOOTBALL GAME; **4,249,735, same,** ELECTRONIC SIMULATED FOOTBALL GAME AND METHOD; **4,249,744, same,** TWO-PLAYER ELECTRONIC SPORTS ACTION GAME, **filed** Feb. 19, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81-0848, *Entex Industries, Inc.* v. *Coleco Industries, Inc.*

4,249,735, Eric Bromley, ELECTRONIC SIMULATED FOOTBALL GAME AND METHOD, **filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0817, *Coleco Industries, Inc.* v. *Calfax, Inc.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0818, *Coleco Industries* v. *Tandy Corp.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0819, *Coleco Industries, Inc.* v. *Entex Industries, Inc.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0820, *Coleco Industries, Inc.* v. *Mattel, Inc.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0821, *Coleco Industries* v. *Conic Investment Co., Ltd.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0823, *Coleco Industries, Inc.* v. *Bambino, Inc.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0824, *Coleco Industries, Inc.* v. *Tudor Games, Inc.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0825, *Coleco Industries, Inc.* v. *Enterprex International Corp.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0827, *Coleco Industries, Inc.* v. *Tiger Electronic Toys, Inc.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0828, *Coleco Industries, Inc.* v. *Dimerco Enterprises Corp.* **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0822, *Coleco Industries, Inc.* v. *Pro-Quality Electronic Co., Ltd.* Notice and Order of Voluntary Dismissal without prejudice filed by Plaintiff on June 11, 1981. **Same, filed** Feb. 10, 1981, D.C., S.D.N.Y., Doc. 81-Civ-0826, *Coleco Industries* v. *Barney Hongkong Ltd.* Defendants are enjoined from further infringing Pat. No. 4,249,735 per Consent Judgment filed July 27, 1981.

4,249,735. (See 4,249,734.)

4,249,744. (See 4,249,734.)

4,253,624, Robert E. Colbert, WELDING WIRE DISPENSER, **filed** May 19, 1982, D.C., S.D. Ohio (Dayton), Doc. C-3-82-242, *National-Standard Co.* v. *Hobart Brothers Co.* Order of Dismissal with prejudice filed Dec. 20, 1983.

4,254,929, Robert H. Popper, Jr., APPARATUS FOR ENABLING MOVEMENT OF A BINDER, **filed** May 13, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 3043, *J. S. Popper, Inc.* v. *Selzee, Inc.*

4,256,419, John R. Haan, ENDPLATE STOP FOR SILAGE DISTRIBUTOR, **filed** Sept. 1, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-4295, *Even-Flo Silage Distributor, Inc.* v. *Lancaster Level-Flo, Inc.*

4,278,414, Weisner and Walls, APPARATUS FOR MAKING PLASTIC SKYLIGHTS; **4,344,261, same,** IMPROVED SKYLIGHT, **filed** Oct. 7, 1982, D.C., M.D. Fla. (Orlando), Doc. 82-530 Orl-Civ-R, *Kenergy Corp.* v. *Sun-Tek Industries, Inc.*

4,298,601, Alan N. Howard, METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY, **filed** June 9, 1983, D.C., W.D.N.Y. (Buffalo), Doc. 83-628C, *Cambridge Plan International* v. *Republic Drug Co.* Case closed administratively, without prejudice, on Oct. 25, 1983. **Same, filed** Nov. 7, 1983, D.C. Nev. (Las Vegas), Doc. CV-LV-83-754 RDF, *Cambridge Plan International* v. *Stanford International, Inc., et al.*

4,300,523, Robertson and Robertson, BARBECUE OVEN, **filed** Jan. 6, 1984, D.C., E.D. Mo. (St. Louis), Doc. 84-33C(3), *B. B. Robertson Co.* v. *David B. Knight & Associates, Inc., et al.*

4,312,808, Paul Lienhard, RED MONOAZO DYESTUFFS; **4,378,970, same,** RED MONOAZO SULPHONIC ACID DYESTUFFS FOR POLYAMIDE, **filed** June 2, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-2613, *Ciba-Geigy Corp.* v. *Crompton & Knowles Corp.* Pat. Nos. 4,312,808 and 4,378,970 are valid. Defendant is enjoined permanently from further infringing Pat. Nos. 4,312,808 and 4,378,970 during their unexpired terms. Dated Jan. 5, 1984.

4,328,794, Robert E. Holmes, TRACTION SPLINT, **filed** Mar. 28, 1983, D.C., W.D.N.C. (Charlotte), Doc. C-C-83-0188-M, *Conaway Enterprises, Inc.* v. *Emergency Products Group, Inc.*

4,344,261. (See 4,278,414.)

4,347,553, John R. Saron, FLEXIBLE LIGHT WITH PROTECTIVE CAP, **filed** Nov. 9, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 8030, *Key Medical, Inc.* v. *Lee's Enterprises, Inc., et al.*

4,367,564, John D. Holley, SWEEPER BRISTLE AND METHOD OF MAKING, **filed** Aug. 18, 1983, D.C. Colo. (Denver), Doc. 83-Z-1480, *Holley Engineering Co., Inc.* v. *Western Sling Co., Inc., et al.*

4,369,475, Ho and Bippy, ENCLOSED DISC DRIVE WITH IMPROVED AIR FLOW, **filed** Dec. 15, 1983, D.C., N.D. Calif. (San Jose), Doc. C-83-20427 WAI, *Priam Corp.* v. *Atasi Corp.*

4,373,277, Edward Cucheran, CUTTER EXTENSION CONE, **filed** Oct. 18, 1983, D.C., E.D. Va. (Norfolk), Doc. 83-694-N, *J. A. LaPorte, Inc.* v. *Norfolk Dredging Co.*

4,376,340, Ramun and Ramun, MATERIAL HANDLING AND SHEARING ATTACHMENT FOR A BACKHOE, **filed** Oct. 11, 1983, D.C. Minn. (Duluth), Doc. 5-83-299, *Allied Gator, Inc.* v. *LaBounty Mfg., Inc., et al.*

4,378,970. (See 4,312,808.)

4,384,795, Bill N. Lutes, STANDARDIZED INTERFACE FOR ACOUSTIC BAR TYPEWRITERS, **filed** June 21, 1983, D.C., C.D. Calif. (Los Angeles), Doc. CV834020 TJH, *Cord, Ltd.* v. *SCM Corp.*

D. 257,763. (See 3,807,713.)

PATENT NOTICES

Certificates of Correction for the Week of Mar. 20, 1984

D. 265,857	4,390,202	4,406,002	4,415,587
3,299,203	4,390,930	4,406,401	4,416,032
4,081,091	4,391,955	4,406,696	4,416,572
4,277,822	4,392,386	4,407,271	4,416,649
4,280,179	4,393,677	4,407,981	4,417,144
4,325,245	4,394,674	4,408,835	4,417,720
4,328,932	4,394,763	4,409,126	4,420,343
4,336,413	4,395,048	4,409,562	4,420,389
4,349,600	4,395,764	4,409,819	4,420,573
4,350,183	4,396,910	4,409,856	4,421,138
4,350,795	4,397,052	4,410,230	4,421,259
4,359,563	4,398,194	4,410,234	4,421,462
4,360,205	4,399,020	4,410,356	4,421,818
4,366,071	4,399,208	4,411,372	4,421,919
4,369,357	4,399,249	4,412,211	4,422,846
4,373,600	4,399,436	4,412,222	4,423,448
4,374,364	4,402,281	4,412,972	4,423,932
4,379,185	4,403,179	4,413,147	4,424,343
4,379,335	4,404,022	4,413,186	4,424,843
4,379,874	4,404,311	4,413,666	4,425,144
4,382,871	4,404,384	4,413,718	4,425,380
4,384,219	4,404,533	4,414,219	4,425,421
4,386,508	4,405,023	4,414,668	4,425,422
4,387,357	4,405,177	4,414,864	4,425,551
4,388,412	4,405,907	4,415,405	4,426,083
4,389,678	4,405,982	4,415,458	4,426,130

Disclaimers

3,613,818.—*George E. Schubert,* Aurora; *Lloyd D. Swayze,* Yorkville; and *John B. Waggoner,* Joliet, Ill. EMERGENCY SUPPLY SYSTEM FOR VEHICLE HYDRAULIC COMPONENTS. Patent dated Oct. 19, 1971. Disclaimer filed Jan. 16, 1984, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 1, 2, 3, and 4 of said patent.

3,952,510.—*Wayne A. Peterson,* Joliet, Ill. FLOW SENSING AND CONTROL APPARATUS. Patent dated Apr. 27, 1976. Disclaimer filed Jan. 16, 1984, by the assignee, *CaterpillarTractor Co.*

Hereby enters this disclaimer to claims 1, 2, and 3 of said patent.

4,190,235.—*William C. Dell,* Washington, D.C. FLUIDIZED BED LADLE HEATING METHOD AND APPARATUS. Patent dated Feb. 26, 1980. Disclaimer filed June 6, 1983, by the assignee, *The Cadre Corp.*

Hereby enters this disclaimer to claims 1, 2, 4, 31 and 33 of said patent.

4,324,839.—*Robert B. Frye,* Menands, N.Y. SILICONE RESIN COATING COMPOSITION. Patent dated Apr. 13, 1982. Disclaimer filed Dec. 27, 1983, by the assignee, *General Electric Co.*

The term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

4,341,550.—*Ferenc M. Pallos,* Walnut Creek; *Mervin E. Brokke,* Moraga and *Duane R. Arnekley,* Sunnyvale, Calif. HERBICIDE COMPOSITIONS. Patent dated July 27, 1982. Disclaimer filed Dec. 15, 1983, by the assignee, *Stauffer Chemical Co.*

The term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

4,382,186.—*A. Stuart Denholm,* Lincoln; *William A. Frutiger,* Beverly; and *Kenneth E. Williams,* Andover, Mass. PROCESS AND APPARATUS FOR CONVERGED FINE LINE ELECTRON BEAM TREATMENT OF OBJECTS. Patent dated May 3, 1983. Disclaimer filed Jan. 4, 1984, by the assignee, *Sony Corp. of America.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimers and Dedications

Des. 260,418.—*Stanley Z. Baker,* Cuyahoga County; and *Benjamin H. Baker,* Geauga County, Ohio. ADHESIVE TRAP FOR RODENTS. Patent dated Aug. 25, 1981. Disclaimer and Dedication filed Dec. 12, 1983, by the assignee, *J. T. Eaton & Co., Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,959,624.—*Walter Kaslow,* New York, N.Y. CODED MERCHANDISING COUPON. Patent dated May 25, 1976. Disclaimer and Dedication filed Nov. 15, 1983, by the *inventor.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

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California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 18, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director 10-28-82
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.

GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director 7-16-73
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.

HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director 1-05-83
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.

COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director 7-26-82
Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.

SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—
R. F. WHITE, Director 1-16-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director 1-03-82
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.

SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director 6-01-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.

INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director 7-06-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.

RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—
G. M. FORLENZA, Director 3-17-82
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.

ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director 9-30-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.

DESIGN, GROUP 290—KENNETH L. CAGE, Director 1-14-71
Industrial Arts; Household, Personal and Fine Arts.

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 6-04-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.

MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director 6-21-82
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.

AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—
R. E. AEGERTER, Director 11-04-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.

HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director 11-20-81
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.

GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—
A. L. SMITH, Director 7-23-81
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.

Expiration of patents: The patents within the range of numbers indicated below expire during February 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,302,213 to 3,307,199, inclusive
Plant Patents ..... Numbers 2,707 to 2,722 inclusive

REEXAMINATIONS

MARCH 20, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,560,287 (173rd)
METHOD AND APPARATUS FOR PROTECTING INSULATED PIPE

Robert W. Helling, Greeley, Colo., assignor to Ceel-Co., Lakewood, Colo.

Reexamination Request No. 90/000,130, Dec. 24, 1981.
Reexamination Certificate for Patent No. 3,560,287, issued Feb. 2, 1971, Ser. No. 634,347, Apr. 27, 1967.
Int. Cl.³ B29D *23/10*
U.S. Cl. 156—218

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–7, having been finally determined to be unpatentable, are cancelled.

[1. A method for ensheathing an insulated pipe with a smooth-surfaced, impermeable sheet of tough, strong, synthetic resin having the characteristics of high-impact polystyrene formed to a thickness in the range of approximately 0.030 to 0.060 inch and prepared as a rectangular member having a length of a selected module and a width exceeding the circumference of the pipe insulation by an amount sufficient to provide for a lap and including the steps of:

curling the sheet to a permanent curl having a radius which will snugly embrace a predetermined range of sizes of pipe insulation with the edges wrapped;

wrapping the sheet about a straight section of the pipe;

lapping the longitudinal edges of the sheet as the wrap is completed; and

welding the contacting surfaces of the lapped edges with a fluid cement having therein a solvent of the said resin whereby to effect substantially hermetic seal of the insulation within the sheath.]

B1 3,579,540 (174th)
METHOD FOR PROTECTING NONPOROUS SUBSTRATES AND FOR RENDERING THEM WATER REPELLENT

Howard G. Ohlhausen, 82 Graymoor Ln., Olympia Fields, Ill. 60461

Reexamination Request No. 90/000,439, Aug. 30, 1983.
Reexamination Certificate for Patent No. 3,579,540, issued May 18, 1971, Ser. No. 772,856, Nov. 1, 1968.
Filed Aug. 30, 1983, Ser. No. 772,856
Int. Cl.³ C08K *5/42*
U.S. Cl. 523—169

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, **9** and **11** are determined to be patentable as amended:

Claims **3–8**, **10**, and **12–16**, dependent on amended claims, are determined to be patentable.

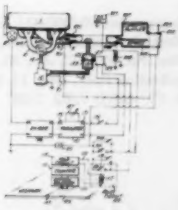
1. A process for rendering a nonporous substrate water repellent comprising treating said substrate with a composition consisting essentially of an alkyl polysiloxane having the formula:

[wheein] *wherein* n is an integer greater than 1, R_1 is a lower alkyl radical containing from 1–7 carbon atoms, and R_2 is hydrogen, a lower alkyl radical containing from 1–7 carbon atoms, or an aryl radical containing about 6 carbon atoms, *an organic solvent,* and a mineral acid selected from the group of sulfuric acid, phosphoric acid, aromatic sulfonic acids, aliphatic sulfonic acid and hydrochloric acid, said acid is present in an amount about 2.5% to 30% based on the weight of said polysiloxane.

B1 3,788,284 (175th)
FEEDBACK MODULATION OF EXHAUST GASES IN INTERNAL COMBUSTION ENGINES

Conrad O. Gardner, 22905 108th West, Edmonds,, Wash. 98020

Reexamination Request No. 90/000,390, Jun. 2, 1983.
Reexamination Certificate for Patent No. 3,788,284, issued Jan. 29, 1974, Ser. No. 255,327, May 22, 1972.
Int. Cl.³ F02B *33/00*; F02M *25/06*
U.S. Cl. 123—571



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** and **15–18** is confirmed.

Claim **12** is determined to be patentable as amended:

Claims **13** and **14**, dependent on amended claims, are determined to be patentable.

1. In an internal combustion engine having an intake manifold, and a feedback path coupled between said exhaust mani-

fold and said intake manifold for recirculating exhaust gases from said exhaust manifold to said intake manifold;

means for modulating the rate of flow of exhaust in said feedback path, said means comprising:

timing means including a pulse source for generating first control signals;

modulator circuit means including a multivibrator circuit responsive to said first control signals for providing valve control signals, and,

valve means disposed in said feedback path and responsive to said valve control signals for modulating the rate of flow of exhaust gases in said feedback path.

B1 3,808,340 (176th)
MEAT COATED PRODUCT

Hugh C. Palmer, Rutland, England, assignor to Kal Kan Foods, Inc., Vernon, Calif.

Reexamination Request No. 90/000,057, Aug. 17, 1981.
Reexamination Certificate for Patent No. 3,808,340, issued Apr. 30, 1974, Ser. No. 162,022, Jul. 12, 1971.
Int. Cl.[3] A23K *1/10, 1/14, 1/18*
U.S. Cl. 426—92

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

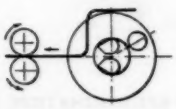
Claims 1–17 having been finally determined to be unpatentable, are cancelled.

[1. An animal food product having the substantial appearance, flavor and aroma of meat tissue in the form of discrete, bite-sized pieces comprising cores enclosed within covers of substantial thickness encasing the surfaces and tenaciously bonded around, concealing and masking the taste and appearance of said cores, said covers comprising a substantial quantity of natural meat materials as animal tissue solids to provide the flavor, taste and aroma characteristics of meat tissue of high palatability, and masking said core material, said cores being formed of material of generally lower palatability and composed in substantial part of starch-containing cereal alone or admixed with animal meals or fish meals.]

B1 3,991,600 (177th)
STIRRUP MACHINE

Remigio Del Fabro, Villaggio Morena n. 62, Reana Del Roiale, Udine, Italy 33010

Reexamination Request No. 90/000,331, Feb. 17, 1983.
Reexamination Certificate for Patent No. 3,991,600, issued Nov. 16, 1976, Ser. No. 597,372, Jul. 18, 1975.
Claims priority, application Italy, Nov. 15, 1974, 83429/74
Int. Cl.[3] B21D *7/02, 7/08*
U.S. Cl. 72—203



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 5 is confirmed.

Claim 1 is determined to be patentable as amended:

Claims 2–4, dependent on amended claims, are determined to be patentable.

New claims 6–9 are added and determined to be patentable.

1. A stirrup machine for bending of stock material such as bars, wires, metal strips or the like and forming individual, bent pieces therefrom, the machine comprising:

advancing and reversing means for selectively advancing feed of the stock material which is to be bent and reversing feed of the stock material which has been bent;

support means for supporting the stock material to be bent;

first operating means connected to said support means for enabling said support means to be moved forward or backward with respect to the stock material;

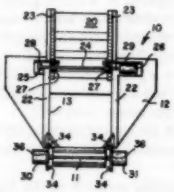
bending means mounted on said support means for bending the stock material, said bending means being connected to said first operating means and being movable with said support means; and

shearing means mounted between said advancing and reversing means and said bending means for shearing the stock material at a desired location subsequent to bending and reversal thereof, *whereby after said stock material has been bent, said advancing and reversing means can be actuated to reverse the stock material to a position adjacent said shearing means, so that upon actuation of said shearing means, the bent piece is cut from the stock material close to the bend, thereby reducing stock material waste.*

B1 4,266,731 (178th)
DUMP SPREADER

Charles S. Musso, Jr., Bath, N.Y., assignor to Air-Flo Manufacturing Co., Inc., Prattsburg, N.Y.

Reexamination Request No. 90/000,356, Mar. 28, 1983.
Reexamination Certificate for Patent No. 4,266,731, issued May 12, 1981, Ser. No. 83,688, Oct. 11, 1979.
Continuation-in-part of Ser. No. 36,771, May 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,202, Dec. 4, 1978, abandoned.
No. 83,688
Int. Cl.[3] A01C *19/00;* **E01C** *19/20*
U.S. Cl. 239—676



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–3, having been finally determined to be unpatentable, are cancelled.

[1. A dump spreader truck body having hopper-shaped side walls sloping downward to a wide bottom conveyor that can drive at different speeds and extends beyond a rear end of said body, said dump spreader comprising:

a. a single rear door for both dumping and spreading material from said body;

b. a fixed rear wall connected between said side walls at said rear end of said body and extending vertically to provide support for said rear door;

c. said fixed rear wall having an opening approximately the width of said conveyor and extending vertically from said conveyor upward to about one-half to three-quarters of the height of said rear wall;

d. said door being large enough to close said opening and being mounted for vertical movement on said rear wall over said opening;

e. a hydraulic drive powerful enough for moving said door vertically against the resistance of material loaded in said body or lying on said conveyor under said door after partially dumping material from said body; and

f. said hydraulic drive being operable for setting said door at variable low heights above said conveyor for metering the flow of said material from said body during spreading and for raising said door above the top of said fixed rear wall for fully opening said opening for dumping material quickly.]

B1 4,338,654 (179th)

VARIABLE SPOT STAGE LIGHT

Richard Logothetis, 631 Johnson Ave., Bohemia, N.Y. 11716

Reexamination Request No. 90/000,355, Apr. 4, 1983.
Reexamination Certificate for Patent No. 4,338,654, issued Jul. 6, 1982, Ser. No. 183,058, Sep. 20, 1980.
Filed Apr. 4, 1983, Ser. No. 183,058
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—268

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

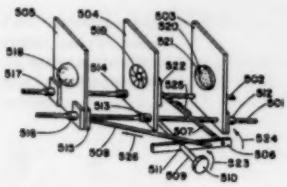
Claims 1 and 2, having been finally determined to be unpatentable, are cancelled.

[1. A stage light comprising:

(a) a frame, having a forward direction towards which the light is to be beamed, and a reward direction opposite the forward direction,

(b) an incandescent lamp movably mounted within the frame and located towards the rear of the frame,

(c) a reflector placed adjacent and to the rear of the lamp and on the same movable mounting as the lamp having general hemispherical coverage of the lamp generally parabolic contours to capture and beam the light from the rear of the lamp in the forward direction,



(d) a variable aperture iris fixedly mounted to the frame and positioned forward of the lamp to control the amount of light from the lamp and reflector passed in the forward direction by means of varying the aperture size,

(e) an objective lens system located forward of the iris to accept and focus the light passed through the iris, and

(f) means for linking the lamp and reflector on the movable mounting to the iris to automatically adjust the iris aperture with the movement of the lamp and reflector for maximum forward light transmission with each setting of the lamp and reflector position.]

REISSUES

MARCH 20, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

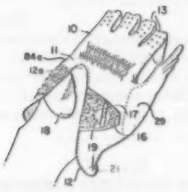
Re. 31,538
GOLF GLOVE

Anthony J. Antonious, 205 E. Joppa Rd., Unit 1603, Towson, Md. 21204

Original No. 3,588,917, dated Jun. 29, 1971, Ser. No. 840,347, Jul. 9, 1969. Application for reissue May 4, 1983, Ser. No. 491,552

Int. Cl.³ A41D *19/00*

U.S. Cl. 2—161 A **30 Claims**



1. An athletic glove comprising: a hollow flexible body member having *an access opening, a* front *portion* and *a* back [portions] *portion, said front portion including a palm area and said back portion including a knuckle area and a palm heel area located adjacent said knuckle area and between the front and back portions; glove* stalls for [at least] four fingers *and a thumb* of [the wearer] *a wearer's hand* projecting from the body member; the back portion being provided with [an] *a deep vent portion in the access* opening, *the deep vent portion* extending from the [end of] *access opening in* the body member to approximately the [stalls] *knuckle area*; first elastic means located in the back portion between the glove stalls and the *access* opening[.]; [a] *an elongated* flexible fastening tab extending from one edge of the *deep vent portion of the access* opening; a complementary fastener located *on the back portion* adjacent the opposite edge of the *deep vent portion of the access* opening [on the back portion], *said flexible fastening tab and said complementary fastener in combination providing multi-adjustable, separable hook and loop locking means for closing the deep vent portion; the flexible fastening tab and complementary fastener are located on opposite sides of the deep vent portion adjacent the knuckle area and positioned between the thumb stall and the palm heel area so that when the tab and complementary fastener coact to span and close the deep vent portion, direct pulling forces are applied to the back portion and the palm heel area to attain and retain a taut fit across the back and palm portions of the glove;* and second elastic means in conjunction with the back portion adjacent the flexible fastening tab.

Re. 31,539
REMOTE-CONTROL DEVICE FOR A CRANE

Frank P. Spalluto, Piscataway, N.J., assignor to Garden State Engine & Equipment Co., Inc., South Plainfield, N.J.

Original No. 4,307,810, dated Dec. 29, 1981, Ser. No. 106,374, Dec. 21, 1979. Application for reissue Sep. 30, 1982, Ser. No. 431,739

Int. Cl.³ B66C *13/42*

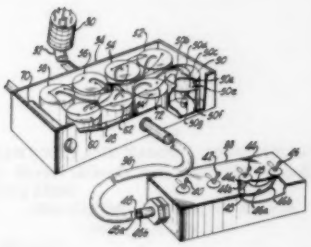
U.S. Cl. 212—160 **8 Claims**

7. A remote-control assembly for controlling a crane or the like having a movable member, wherein said crane includes an electrical control circuit for controlling said movable member, comprising:

a remote-control box including a plurality of fluid valves and means for operating said fluid valves;

a converter box including a plurality of pressure switches;

each of said pressure switches including movable means having an electrical contact;



each of said pressure switches being formed by a separate housing for enclosing said movable means and said electrical contact;

a plurality of fluid lines connecting said fluid valves to operate the movable means in each of said pressure switches; and

a plurality of electric lines connecting the electrical contacts of said pressure switches to said electrical control circuit on said crane for operating said movable member.

Re. 31,540
SEPARATION OF HIGH GRADE MAGNETITE FROM FLY ASH

Robert G. Aldrich, Manlius, N.Y., assignor to Halomet, Incorporated, Manlius, N.Y.

Original No. 4,319,988, dated Mar. 16, 1982, Ser. No. 146,697, May 5, 1980. Application for reissue May 26, 1982, Ser. No. 382,150

Int. Cl.³ B02C *23/14*

U.S. Cl. 209—172.5 **11 Claims**

1. A high purity magnetite derived from fly ash which is the product of coal combustion obtained by:

[(a) subjecting fly ash to dry magnetic separation;

(b) forming a slurry comprising the magnetic fraction obtained from said dry separation;]

[(c)] (*a*) subjecting *a slurry derived from fly ash* [such slurry] to a first wet magnetic separation;

[(d)] (*b*) screening the magnetic fraction from said first wet magnetic separation;

[(e)] (*c*) subjecting the oversized particles to grinding;

[(f)] (*d*) screening the products from said grinding step;

[(g)] (*e*) subjecting the passed material from the screening steps [(d) and (f)] (*b*) *and* (*d*) to a final wet magnetic separation; and

[(h)] (*f*) separating a high purity magnetite from said final wet separation.

PLANT PATENTS

GRANTED MARCH 20, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,207

ALSTROEMERIA NAMED STALILAS

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M. C. van Staaveren, Aalsmeer, Netherlands

Filed Sep. 13, 1982, Ser. No. 416,841
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. The new and distinct alstroemeria cultivar substantially as herein shown and described, characterized by the distinctive light purple coloration of the flowers with white coloring on about the inner third of the inside petals, and by the sturdy and relatively long peduncle for each of the flowers.

5,208

ALSTROEMERIA CULTIVAR NAMED STALLUC

Jacob van Andel, Aalsmeer, Netherlands, assignor to M. C. B. V. Handelskweke M. C. van Staaveren, Aalsmeer, Netherlands

Filed Sep. 13, 1982, Ser. No. 416,842
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct alstroemeria cultivar substantially as herein shown and described, characterized by the distinctive bluish-purple coloring of the flowers, and by the light yellow coloring toward the base of each of the inside petals and the bright longitudinally extending pencil stripes on the base of each inside petal to near the tip end thereof.

5,209

HIBISCUS PLANT NAMED "ANNE ARUNDEL"

Robert H. Darby, Oaknoll, Apt. S-432, 701 Oaknoll Dr., Iowa City, Iowa 52240

Filed Sep. 24, 1982, Ser. No. 422,878
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive cultivar of hibiscus substantially as herein shown and described, having a pink flower of elegant form and substance, a plant of great landscape value, blooming profusely from midsummer to frost.

PATENTS

GRANTED MAR. 20, 1984

ERRATA

For CLASS	See PATENT NO.
502–169	4,438,019
502–341	4,438,021
436–053	4,438,186

PATENTS

GRANTED MARCH 20, 1984

GENERAL AND MECHANICAL

4,437,191

IMPLANT OF CERAMIC MATERIAL

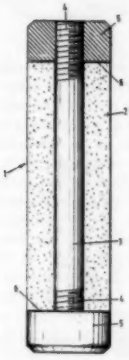
Joseph M. van der Zel, Zwaag, and Klaas de Groot, Heemstede, both of Netherlands, assignors to Delphi Dental Industries B.V., Le Hoorn, Netherlands

Filed Apr. 2, 1982, Ser. No. 364,975

Claims priority, application Netherlands, Apr. 3, 1981, 8101674

Int. Cl.³ A61F *1/00*

U.S. Cl. 3—1 **5 Claims**



1. A medical implant compatible with bone and similar tissue and exhibiting improved strength when subjected to cyclic bending and tensile stresses comprising a hollow cylindrical ceramic body composed of a material selected from the group consisting of alumina, sintered tricalcium phosphate, and bioactive glass ceramic having a glass matrix containing calcium phosphate, said body being longitudinally compressed by means of a metallic member extending longitudinally through a central portion thereof and by compression means affixed to each end of said metallic member to provide a constant compressive force sufficient to prestress the material of said body wherein the compressive force exterted against said ceramic body is lower than half the sum of cyclical tensile stress and cyclical compressive stress to which the implant will be subjected under normal conditions before implanting the same.

4,437,192

IMPLANTS OF BIOLOGICALLY ACTIVE GLASS OR GLASS CERAMIC CONTAINING TITANIA

Takamitsu Fujiu, Tokyo; Makoto Ogino; Michio Kariya, both of Yokohama, and Takeo Ichimura, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 270,588, Jun. 4, 1981, abandoned. This application Mar. 16, 1983, Ser. No. 476,041

Claims priority, application Japan, Jun. 11, 1980, 55-77841

Int. Cl.³ A61F *1/00, 1/24*

U.S. Cl. 3—1.9 **3 Claims**

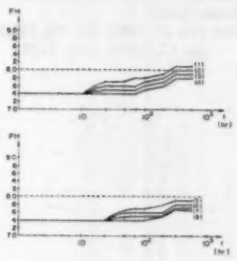
1. An improved implant comprising a biocompatible metal core coated with a layer of a biologically active glass or glass-ceramic having a composition consisting essentially of by mol%:

SiO_2	40–60
B_2O_3	8–15
Na_2O	15–30
CaO	8–30
P_2O_5	0–8

-continued

K_2O	0–20
Li_2O	0–10
MgO	0–5
$Al_2O_3 + ZrO_2 + Nb_2O_5$	0–8
$La_2O_3 + Ta_2O_5 + Y_2O_3$	0–8 and
F_2	0–15

the glass or glass-ceramic having substantially the same thermal expansion coefficient as that of the metal core, wherein the improvement comprises adding TiO_2 in an amount from 0.5 to 3 mole% to make up a total of 100 mol% glass composition to



regulate the degree of biological activity of the glass or glass-ceramic represented by a saturated pH-value at the time when the glass or glass-ceramic is immersed in a simulated physiolgical solution, with no substantial change of the thermal expansion coefficient of the glass or glass-ceramic.

4,437,193

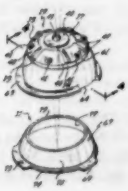
PROTRUSIO CUP

Indong Oh, 851 Lyndon St., South Pasadena, Calif. 91030

Filed Jan. 18, 1982, Ser. No. 340,024

Int. Cl.³ A61F *1/04*

U.S. Cl. 3—1.912 **18 Claims**



1. A protrusio cup which can be implanted as a unit in the acetabulum comprising:

an acetabular cup adapted to be received within the acetabulum;

said acetabular cup having an inner concave bearing surface of generally part spherical configuration defining a cavity which opens at a mouth, said bearing surface being adapted to receive a femoral head and slidably cooperate therewith;

said acetabular cup having an outer surface;

a protrusio shell having a part spherical annular segment receiving a circumferentially extending annular region of the acetabular cup adjacent the mouth of the acetabular cup and flange means adjacent one end of the annular segment projecting generally radially of the annular seg-

ment and adapted to engage the bony region around the acetabulum, the other end of the annular segment of the protrusio shell being open with the acetabular cup extending through the opening;

means for mounting the protrusio shell on the acetabular cup prior to implantation whereby the acetabular cup with the protrusio shell mounted thereon can be implanted as a unit in the acetabulum; and

said mounting means including a circumferentially extending groove formed in the outer surface and lying entirely within the annular region of the acetabular cup which receives at least a portion of the annular segment of the protrusio shell.

4,437,194

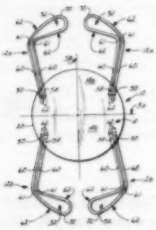
INTRAOCULAR LENS ASSEMBLY

Gregory L. Hahs, Montclair, Calif., assignor to Optical Radiation Corp., Azusa, Calif.

Filed Feb. 25, 1982, Ser. No. 352,390

Int. Cl.³ A61F 1/16, 1/24

U.S. Cl. 3—13 **30 Claims**



1. An intraocular lens assembly for implantation into the human eye comprising:

(a) a lens body; and

(b) a pair of haptic positioners for contacting eye tissue to thereby hold the lens body in position in the eye, each such haptic positioner comprising a filament connected at both ends to the edge of the lens body for forming a closed loop extending away from the lens body, the closed loop being narrower at the end adjacent the lens body and wider at the end remote from the lens body, with the remote end of one of such loops facing the remote end of the other loop.

4,437,195

SELF-INFLATING BEDPAN

Ralph W. Mangels, 345 N. Arizona Ave., Chandler, Ariz. 85224

Filed Feb. 22, 1982, Ser. No. 351,128

Int. Cl.³ A61H 9/00

U.S. Cl. 4—456 **6 Claims**

1. A disposable, self-inflating bedpan comprising

(a) a closed, generally ring-shaped, flexible and inflatable portion constructed from a fluid imprevious material to produce a curved, pan-shaped configuration when said portion is inflated, said ring-shaped portion enclosing and defining an interior area and having

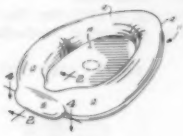
(i) a first end generally positioned under the sacrococcygeal area of a bedfast patient, and

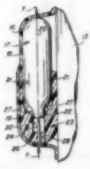
(ii) a second end generally positioned beneath and spanning any space between the upper leg areas of said bedfast patient,

said material having an exterior surface area,

(b) a fluid impervious flexible panel connected to said ring-shaped portion and spanning said interior area thereof such that when said ring-shaped portion is inflated a self-supporting fluid-tight reservoir having a continuous upstanding wall for collecting and retaining bodily excrement is formed,

(c) manually activated means positioned adjacent said exterior surface of said material of said second end and outside of said interior area of said ring-shaped portion of said bedpan for producing gas for inflating said ring-shaped portion of said bedpan, said inflating means generally





being positioned on said exterior surface of said second end such that

said inflating means can be readily reached and manually activated by a medical attendant after said bedpan is positioned beneath said bedfast patient, and

gas released when said inflating means is manually activated flows into said ring-shaped portion to inflate the same.

4,437,196

SUPPORT DEVICE FOR HELPING A PERSON TO GET OUT OF A BATHTUB

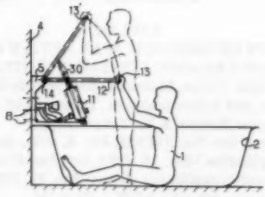
Pierre A. G. Louis, 38, Rue Ginoux, 75015 Paris, France

Filed Apr. 16, 1982, Ser. No. 369,285

Claims priority, application France, Oct. 14, 1981, 81 19296; Jan. 4, 1982, 82 00022

Int. Cl.³ A47K 3/12

U.S. Cl. 4—564 **18 Claims**



1. A self-operated support device which helps a person to get out of a bathtub, comprising essentially one water supply jack **(11)** supplied under pressure with the supply water from the bathtub and one handle **(13)** (or a harness) set in motion by said jack, characterized in that said handle **(13)** (or harness) is mounted on a lever **(12)** hinged towards one of its ends around an axis **(14)**, the rotating of said lever **(12)** being controlled by said jack which exerts force, at one end **(19)** thereof, on said lever, the other jack end **(17)** being hinged thus allowing the conjugated hinging motions of said lever **(12)** and said jack**(11)**.

4,437,197

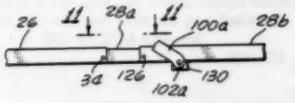
FOLDING SOFA-BED MECHANISM

Melvin P. Spitz, Beverly Hills, Calif., assignor to Kinematic Industries, Inc., Whittier, Calif.

Continuation-in-part of Ser. No. 264,269, May 18, 1981, Pat. No. 4,398,311. This application Nov. 18, 1981, Ser. No. 322,337

Int. Cl.³ A47C 17/14

U.S. Cl. 5—13 15 Claims



1. In a folding sofa-bed construction including a bed frame having a plurality of frame sections, one of which is an inner head section and another an adjacent body section, said sections being pivotally interconnected in end-to-end relation for selective unfolding movement to an extended coplanar bed-forming position and folding movement to a folded retracted sofa seat-forming position in which the body section is disposed generally horizontally along the base of the sofa frame and the head section extends generally upright in a space at the rear of the sofa seat, and mechanism for supporting and controlling the movements of said frame sections during movement of the bed frame to said extended and retracted positions, the improvement comprising:

an inner head section fabricated to provide two frame structures which are pivotally interconnected in end-to-end relation and the outermost of said frame structures is pivotally connected in end-to-end relation to the frame structure of the adjacent body section.

4,437,198

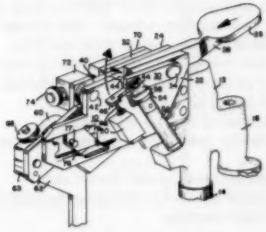
METHOD OF ARTICULATING A WORK SUPPORTING SURFACE

Alphonse C. Kulik, Ipswich, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Oct. 27, 1981, Ser. No. 315,414

Int. Cl.³ A43D 23/04

U.S. Cl. 12—145 9 Claims



1. A method of articulating a work support surface in a machine comprising:

attaching said work support surface to a first end of a support arm;

journalling a first axis through a second end of said work support arm and through a slot in a pair of frame members secured to said machine;

emplacing an arrangement of toggle links with said first axis and a fixed position second axis, said arrangement of toggle links having a common axis connecting them;

extending an extended member from said first axis to a reciprocating means secured to a frame portion of said machine;

and

actuating said reciprocating means so as to cause said toggle link and said work support surface to move rearwardly.

4,437,199

CARPET CLEANING DEVICE

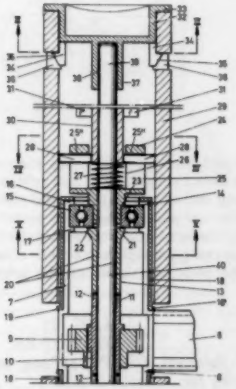
Peter Wulf, Ennepetal, and Annegret Schlecht, Wuppertal, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,498

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114753

Int. Cl.³ A47L 11/18

U.S. Cl. 15—49 R 6 Claims



1. In a carpet cleaning device having a housing and driven brush rollers, the rollers extending in both sides of a drive point, and wherein said rollers are replaceably seated on a shaft in the housing, the device comprising:

a drive gear located at said drive point, and having claws extending from both sides of a hub of said drive gear;

head pieces on both sides of said hub having bayonet slots therein and being rotatable about said shaft;

said brush rollers including means engageable into said bayonet slots of said head pieces;

coupling bushings integrally extend from said head pieces toward said drive gear,

ball bearings operatively disposed in said housing adjacent said coupling bushings, said bushings passing through said ball bearing and having free ends; and wherein

said brush rollers and said hub of the drive gear are rotatable about said shaft; and

said free ends of said coupling bushings having coupling claws operatively engaging with said claws of said hub.

4,437,200

APPARATUS FOR CONTINUOUS DEHYDRATION

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Feb. 11, 1982, Ser. No. 347,958

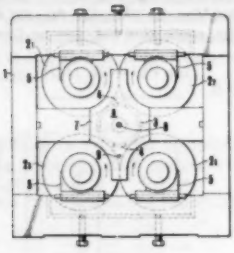
Claims priority, application Japan, Feb. 25, 1981, 56-26610

Int. Cl.³ F26B 13/04

U.S. Cl. 15—306 A 3 Claims

1. An apparatus for continuous dehydration of a cloth comprising two pairs of axially extending rubber rolls with the axes thereof arranged in parallel relation, the rolls in each said pair being pressed against one another and said pairs of rolls being spaced apart, an axially extending tubular seal plate with the axis thereof in parallel relation with the axes of said pairs of rolls and said seal plate is positioned between said two pairs of

rubber rolls with the surface of said seal plate disposed in pressure contact with each of the rubber rolls of said pairs, said seal plate is provided with a pair of oppositely disposed slits extending in the axial direction of said seal plate and aligned with the contact surfaces of said pairs of rubber rolls, and an end plane seal plate blocking each of the end planes of each of said rubber rolls so as to form in combination with said rubber



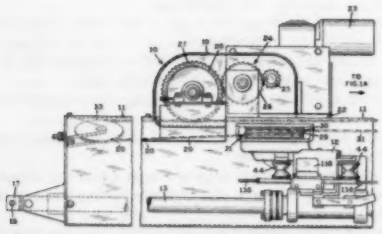
rolls a closed chamber containing and enclosing said tubular seal plate from the exterior of said rubber rolls, and means for maintaining one of high pressure and reduced pressure within said tubular seal plate so that cloth passed in turn between the contacting surfaces of one of said pairs of rolls, through the slits in said seal plate and then between the contacting surfaces of the other said pair of rolls can be dehydrated.

4,437,201

SOOT BLOWER

Gerald F. Zalewski, Erie, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 13, 1981, Ser. No. 321,276
Int. Cl.³ F23J *3/02*
U.S. Cl. 15—316 R **26 Claims**



1. In a soot blower of the long retracting type including a traveling carriage rotatably supporting a lance tube and movable in an advancing and retracting direction along a predetermined horizontal path of travel between a forwardmost working position and a rearwardmost non-working position, means to impart a horizontal motion to the traveling carriage and a rotational motion to the lance tube, which comprises

(a) a motor means,

(b) horizontal drive means associated with said motor means whereby operation of the motor means energizes the horizontal drive means to advance and retract the traveling carriage along the predetermined horizontal path of travel, and

(c) a rotary drive means mounted on said traveling carriage for rotating said lance tube,

(d) said rotary drive means being mechanically coupled to said motor means through said horizontal drive means whereby operation of the motor means provides a driving input for the rotary drive means,

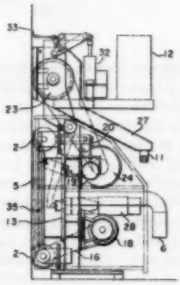
(e) said rotary drive means including independent control means for controlling the rotational velocity and direction of rotation of the lance tube independently of the speed and direction of travel of the traveling carriage.

4,437,202

AUTOMATIC WALL CLEANING MACHINE

Kenichi Nagatsuka, Tokyo, Japan, assignor to Mitsubishi Kakoki Kaisha Ltd.; Kakoki Engineering Service Co., Ltd. and Genshi-Ryoku Daiko Co., Ltd., all of Tokyo, Japan

Filed Aug. 11, 1981, Ser. No. 291,916
Int. Cl.³ A47L *11/202*
U.S. Cl. 15—320 **8 Claims**



5. An automatic wall cleaning machine comprising:

a frame including means for spacing said frame from a wall;

a rotary brush rotatable about an axis fixed to said frame;

a water sprayer fixed to said frame; and

a suction device fixed to said frame, said suction device comprising:

(a) a disk,

(b) suction producing means,

(c) a suction conduit communicating one side of said disk with said suction producing means, and

(d) a plurality of trapezoidal elastic suction leaves connected to the periphery of said disk, each of said leaves having a first relatively narrow end connected to the periphery of said disk, a second relatively wide end longitudinally opposite said first end and side walls connecting said ends, wherein said side walls of adjacent ones of said leaves contact one another, wherein said second ends of said leaves lie in a plane spaced from said disk,

whereby said one side of said disk, said leaves and said wall define a vacuum space when said machine is positioned adjacent said wall.

8. The machine of claim 5 including:

a longitudinally extending reinforcing rib on each of said leaves;

drive means for moving said frame; and

remote control means for changing the direction of movement of said machine.

4,437,203

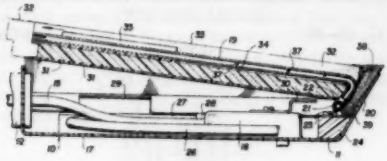
CLEANING HEAD FOR WALL WASHING MACHINES

John A. Wisner, 701 S. Luzerne Ave., Baltimore, Md. 21224

Filed Jun. 8, 1982, Ser. No. 386,429
Int. Cl.³ A47L *7/00*
U.S. Cl. 15—322 **7 Claims**

1. A cleaning head for a wall washing machine or the like comprising a shell, conduit means connected with the shell to deliver cleaning and rinsing fluids thereto selectively and to withdraw such fluids in a continuing cycle of operation, a fluid distribution manifold extending longitudinally of the shell and being within the shell during normal operation and having one end thereof pivotally connected with the shell so that the manifold is swingable with relation to the shell to a sponge

insert release position, a retainer means on the shell to releasably secure the other end of the manifold in said normal use position within the shell substantially parallel to the longitudinal axis of the cleaning head, a replaceable sponge insert for the cleaning head of a size to engage within the shell and being longitudinally recessed to receive said manifold below the working face of the sponge insert and being bodily swingable with the manifold to and from said release position, said retainer means comprising a single removable fastener element



engageable with the other end of the manifold and with one end wall of the shell, the manifold comprising a single tube section having one end portion screw-threaded, the fastener element comprising a screw engaging the screw-threads of the manifold, and said one end of the manifold being shaped to provide a transverse bight adapted for connection with said conduit means within said shell, said bight forming the pivot element for the manifold, and a coacting anchored pivot element within the shell engaging the bight to maintain it on a fixed pivot axis relative to the shell.

4,437,204

VACUUM CLEANER HOUSING

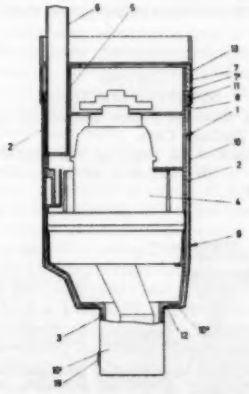
Wieland Gühne, Remscheid, Fed. Rep. of Germany, assignor to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,499

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114752

Int. Cl.³ A47L *9/00*

U.S. Cl. 15—325 **6 Claims**



1. In a vacuum cleaner housing having a handle mount, a socket opposite said mount, and a covering which cushions side surfaces of the housing, the improvement wherein said covering comprises

a wall of semi-rigid material in the form of a cap, said cap being placed on said housing from said socket, said wall extending in self-supporting manner at a distance from sidewalls of said housing, said cap being centered in form-engaging manner on a cylindrical surface of the socket, said cap having an edge zone on the handle mount side, the improvement further comprising

a supporting rib disposed peripherally about said housing, and wherein

said cap is supported for longitudinal displacement in spaced position by said supporting rib.

4,437,205

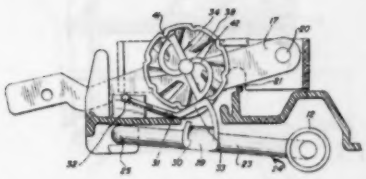
VACUUM CLEANER NOZZLE LIFT DEVICE

David G. Koland, Sandstone Township, Pine County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 11, 1982, Ser. No. 357,135

Int. Cl.³ A47L *5/34*

U.S. Cl. 15—354 **16 Claims**



9. In a vacuum cleaner nozzle having a housing defining an air suction passage, rear wheels for supporting a rear portion of the housing for rolling movement of the nozzle on a subjacent surface to be cleaned, and a U-shaped front wheel assembly including a support having a rear bight pivotally mounted to the housing, a pair of forwardly extending legs, and wheels rotatively carried on a forward distal end portion of said legs to rollingly engage the subjacent surface forwardly of said rear wheels, an improved front-wheel height adjuster comprising:

a lifter movably connected to a leg of said support forwardly of said bight;

means movably mounting said lifter to a portion of the housing; and

means movably carried by the housing for selectively moving said lifter including a user-operated ratchet means for swinging said support about the axis of said bight to selectively raise and lower the front wheels and thereby adjust the angular disposition of the nozzle housing relative to said subjacent surface, said ratchet means comprising a lever pivotally mounted to the housing and having a foot pedal actuation portion, a ratchet wheel rotatably mounted to the housing and having notches and ratchet teeth, a cam rotatable with said ratchet wheel, means responsive to a depression of said foot pedal actuation portion of the lever for selectively engaging said ratchet teeth to advance the ratchet wheel a rotational step as an incident of each depression of the foot pedal actuation portion and a cam follower connected to said lifter for selectively moving the lifter in accordance with the rotational position of said cam.

4,437,206

MULTIPLE REUSABLE TUBULAR CASING, AND APPARATUS AND PROCESS FOR USING SAME IN THE PRODUCTION OF CASELESS (SKINLESS) PARBOIL OR RAW SAUSAGES

Heinz Becker, Zurich, Switzerland, assignor to Ashland Food Technology Holdings S.A.

Division of Ser. No. 201,155, Oct. 27, 1980, Pat. No. 4,371,554. This application Sep. 29, 1982, Ser. No. 428,020

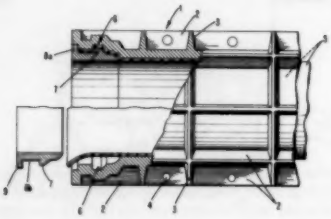
Claims priority, application Switzerland, Nov. 9, 1979, 10067/79

Int. Cl.³ A22C *11/00, 13/00*

U.S. Cl. 17—1 F **23 Claims**

1. A sausage casing capable of multiple reuse for the production of caseless sausage, the casing comprising a tube formed of

a porous polytetrafluoroethylene (PTFE) membrane, said membrane having a microstructure made up of nodes interconnected by fibrils, said PTFE membrane having sufficient porosity to permit venting radially through said tube the steam, water vapor and other gaseous fluids released during processing from the sausage present within said tube, said PTFE membrane also having a surface texture to provide easy release of the processed sausage from said tube following processing while maintaining the integrity of the sausage surface and the sausage as a whole, the gaseous fluid flow paths through the node and fibril microstructure of said membrane limiting the extrusion of solid or liquid sausage material through the membrane during filling of said tube, said PTFE membrane also having



(i) a Gurley No. of about 1 to 650 seconds, as determined per ASTM Method D-726-58 Method A using a 1.00 sq. inch test area, 4.88 in. head of water, and represents the time in seconds to flow 100 cm^3 of air through the test area,

(ii) a Bubble Point pressure of about 3 to 60 psig, as determined per ASTM Method F-316-70, using anhydrous methanol at 21° C. and a test area of 9.6 sq. cm., and

(ii) a Water Entry Pressure of about 7 to 600 psig, as determined by the following procedure: using the apparatus employed in the Mullin's Burst Test (Fed. Std. 191, Method 5512) the pressure of water is raised to a test level over a period of approximately 10 seconds, held at that level for 30 seconds, and the lowest presence or absence of leakage is visually determined, the Water Entry Pressure being the pressure level at which leakage is determined to occur.

4,437,207

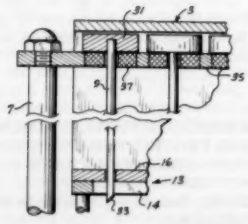
MAGNETIC, FORCE-LIMITED APPARATUS FOR TENDERIZING MEAT

Henry M. Ross, The Lawn, Nokesville, Va. 22123

Filed Jun. 24, 1982, Ser. No. 391,835

Int. Cl.³ A22C *9/00*

U.S. Cl. 17—25 **11 Claims**



1. An apparatus for tenderizing meat comprising

support means for supporting meat to be tenderized,

a plurality of cutting elements comprising relatively thin blades with cutting edges for piercing and cutting meat,

means for mounting each of the cutting elements for independent, force-limited insertion into the meat,

said means for mounting comprising magnetic means associated with each of the cutting elements to provide a predetermined force for holding each cutting element in fixed position as the element is inserted in the meat to be tenderized.

4,437,208

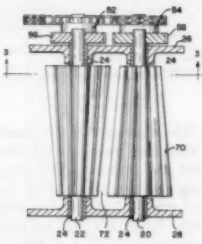
MEAT TENDERIZER

Jacob Sampson, 6138 N. Clark St., Chicago, Ill. 60660

Continuation-in-part of Ser. No. 177,278, Aug. 11, 1980, Pat. No. 4,360,952. This application Jan. 25, 1982, Ser. No. 342,518

Int. Cl.³ A22C *9/00*

U.S. Cl. 17—26 **6 Claims**



1. A meat tenderizing machine comprising a pair of surfaces in spaced parallel relation for passage of the meat therebetween, each surface having a plurality of longitudinally spaced, crosswise extending ribs projecting from the surface whereby the meat is engaged therebetween during passage of the meat between the surfaces, and means for moving the surfaces for travel of the adjacent surfaces in the same direction but with the ribs of one surface moving relative to the other to stretch the meat during passage between the surfaces while being engaged between said ribs, the surfaces comprising a pair of rolls mounted for rotational movement, the rolls being in the form of frusto-conical members of substantially the same cone angle, with the base of one frusto-conical member positioned alongside the apex of the other frusto-conical member whereby adjacent peripheral surfaces travel at substantially the same RPMs.

4,437,209

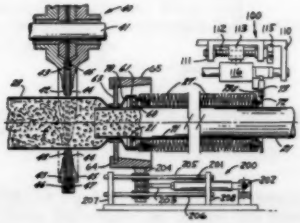
STUFFING METHOD

Herve Duroyon, Beauvais, France, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 16, 1981, Ser. No. 321,664

Int. Cl.³ A22C *11/00*

U.S. Cl. 17—49 **6 Claims**



1. In a method of stuffing flowable product using a stuffing machine of the type compatible with a range of stuffing pressures associated with fully soaked casing, and of the type having a double clipper which constricts the stuffed product by means of a pair of gates, separates the gates, then applies a

pair of clips, said method comprising the steps of stretching the casing with an internal sizing means to establish a holdback force and to stretch the casing to about its recommended stuffed circumference to thereby cause the casing to take a temporary set, interposing a sealing ring near the end of the stuffing horn and over the casing to prevent backup of flowable product, establishing a distance between the sealing ring and the sizing means to establish a casing angle therebetween which increases the holdback force to cause the stuffing of the casing to a desired circumference, the improvement comprising adapting said stuffing machine to stuff controllably premoisturized casing by translating the sealing ring away from the sizing ring after stuffing and during or before gathering to reduce the casing holdback force as evidenced by reduced casing angle, thereby to prevent pressure buildup beyond acceptable limits in the stuffed product during said constricting and separating.

4,437,210
BRIDGE TOP STOP FOR SLIDE FASTENERS

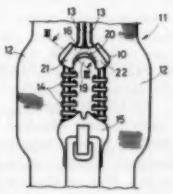
Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 11, 1981, Ser. No. 262,195

Claims priority, application Japan, May 30, 1980, 55-75372[U]

Int. Cl.³ A44B *19/36*

U.S. Cl. 24—435 **2 Claims**



1. A bridge top stop for a slide fastener including a pair of stringer tapes each provided with a reinforced edge for carrying a row of cooperating interlocking fastener elements and a slider reciprocable along the reinforced edges for taking the fastener elements into and out of coupling engagement to open and close the slide fastener, said bridge top stop comprising:

(a) a body adapted to be clamped to the reinforced edges astride the stringer tapes;

(b) said body including a sidewall inwardly curved to define a substantially inverted U-shaped opening receptive of the front portion of the slider and a pair of plates connected at one edge by said sidewall, each of said plates including a pair of laterally spaced first and second wing portions extending away from said opening, said first wing portions and said second wing portions in confronting pair forming jointly with said sidewall a pair of grooves for receiving therein the reinforced edges, respectively;

(c) bulged rib projecting from said sidewall along said opening and extending longitudinally along said sidewall; said bulged rib defining a recess that grips said reinforced edges of the stringer tapes to secure the bridge top stop thereto, said bulged rib projecting progressively into said U-shaped opening in a direction from ends to the mid-portion of said sidewall to trace a crescent shape, and said recess having a depth progressively increasing in a direction from ends to the mid-portion of said sidewall; and

(d) each confronting pair of said wing portions having ridges disposed on the respective free ends thereof and extending longitudinally along one of said grooves for clamping engagement with one of the stringer tapes.

4,437,211
DEVICE FOR LOCKING TOGETHER STACKED OBJECTS

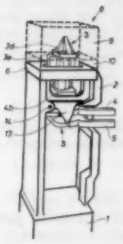
Willi Dorpmund, Elze, Fed. Rep. of Germany, assignor to Graaff KG, Elze, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 114,543, Jan. 23, 1980, abandoned. This application Jun. 1, 1981, Ser. No. 279,488

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927231

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—287 **7 Claims**



1. A device for locking together two stacked objects, the lower object having a plate at its upper end and the upper object having a plate at its lower end, the two plates being in superposed relation when the objects are stacked and each plate having a non-circular opening identical to and in registry with the opening in the other plate, the locking device comprising:

(a) a housing, the top wall of the housing being the plate of the lower object, the housing having a support surface within it and two side walls, each side wall having a front edge and one of the front edges having two pockets,

(b) a bolt within the housing movable vertically and rotatably with respect to the housing, the bolt having a head piece shaped to pass through the plate openings when the bolt is in a first angular orientation but not when the bolt is in a second angular orientation,

(c) a structural unit coaxial with the bolt and movable vertically with the bolt, the structural unit being rotatable with respect to the bolt and to the housing and having a supporting shoulder which does not engage the support surface of the housing when the structural unit is in a first angular orientation but does engage the support surface when the structural unit is in a second angular orientation,

(d) two levers for simultaneously moving the bolt and structural unit vertically between extreme upper and lower positions, movement of the bolt and structural unit upwardly while they are in their first angular orientations passing the bolt head piece through the opening in the plate of the lower object and elevating the supporting shoulder above the housing support surface, one of said levers being arranged to rotate the structural unit to its second angular orientation so that the supporting shoulder engages the housing support surface to maintain the structural unit and bolt in their raised positions, and the other of said levers being arranged to rotate the bolt to its second angular orientation, after an upper object is stacked on the lower object with the bolt head piece passing the opening in the plate of the upper object, so as to lock the two objects together, and

(e) the two levers extending out of the housing between the side walls thereof during vertical movement of the bolt and structural unit, both levers being located with each of the two pockets in the housing when the bolt and structural unit are in each of their two extreme positions, respectively, and also in their second angular orientations.

4,437,212

CLASP FOR GARMENTS, IN PARTICULAR FURS

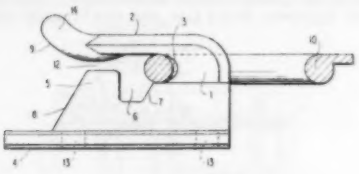
Juergen Stahl; Wilhelm Schuster, and Wilhelm Wegner, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Gold- und Silber-Scheideanstalt Oberstein Franz Reischauer, Idar-Oberstein, Fed. Rep. of Germany

Filed Nov. 17, 1981, Ser. No. 322,163

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045169

Int. Cl.³ A44B *13/00, 1/18*

U.S. Cl. 24—698 14 Claims



1. Hook element of a clasp for garments, in particular furs, which is used in conjunction with an eye element having an eye ring, the hook element consisting of:

(a) a base plate having holes therein for fastening to a garment;

(b) a narrow integral ridge extending in the vertical axial direction and mounted on base plate (a), base plate (a) and narrow integral ridge (b) having a fixed positional relationship;

(c) a hold-down arm, which is elastically movable in a direction normal to base plate (a), connected on one end to elongated narrow integral ridge (b) so as to form a passageway between narrow integral ridge (b) and hold-down arm (c);

(d) a first recess and a second recess provided in narrow integral ridge (b), the first and second recesses facing onto the passageway between narrow integral ridge (b) and hold-down arm (c), a locking web being formed by the portion of narrow integral ridge (b) between the end thereof and the first recess, the second recess being positioned further in the passageway than the first recess and being located in the region of narrow integral ridge (b) at the connection between hold-down arm (c) and narrow integral ridge (b), a positioning web being formed by the portion of narrow integral ridge (b) where the second recess is located; and

(e) an entrance slit provided in the passageway between hold-down arm (c) and the locking web,

the hook element, when engaged in the passageway, can slide between the first and second recesses and its motion is stopped by the locking web or the positioning web depending upon its direction of movement.

4,437,213

MEANS FOR TENON-FORMING A SHROUD TO A TURBINE ROTOR

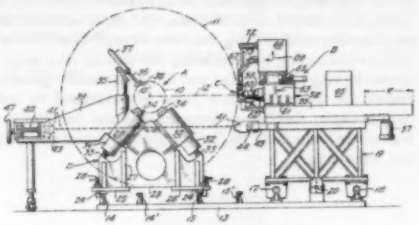
Ira W. Reese, Trenton, and Nello B. Compagnucci, Yardville, both of N.J., assignors to Transamerica DeLaval Inc., Princeton, N.J.

Filed Aug. 19, 1982, Ser. No. 409,600

Int. Cl.³ B23P *23/04*

U.S. Cl. 29—33 K 24 Claims

1. A tenon-forming machine for peening a blade tenon to secure a shroud band to a bladed turbine rotor, comprising means for supporting a turbine rotor on a horizontal axis at two locations offset on opposite axial sides of the axial region of a rotor stage at which shroud bands are to be secured to adjacent blades of the stage, tool-supporting means on one laterally offset side of the horizontal axis of turbine-rotor support, an elongate horizontally oriented cross-brace rail on the other lateral side of the horizontal axis of turbine-rotor support and supported by and between both rotor supports, and means including a chuck forming part of the turbine-rotor support means for engaging and selectively partially rotating a turbine rotor supported thereby; said tool-supporting means comprising a main slide and fixed horizontal ways for its travel parallel to the rotor axis, a secondary slide carried by said main slide and guided for horizontal action normal to the rotor axis, riveting means including an orbital riveting head carried by



said second slide and oriented normal to the rotor axis, an induction-heating element and movable support therefor such that said element may be positioned in and out of induction-heating relation with a blade tenon in advance of a tenon-forming cycle of riveting-head action on the blade tenon, and a tie rod for selectively connecting said secondary slide to the cross-brace rail on a transverse alignment close to but offset from the rotor axis.

4,437,214

NON-MACHINING METHOD OF MANUFACTURING A SOLID-BOTTOMED OR INTERNALLY FLANGED BEARING RACE

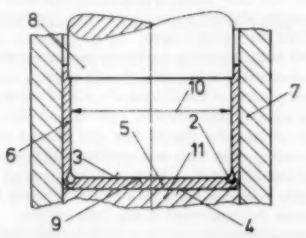
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt; Peter Horling, Mainberg; Hermann Hetterich, Heidenfeld, and Heinrich Kunkel, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,873

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103343

Int. Cl.³ B21K *1/04*

U.S. Cl. 29—149.5 DP 8 Claims



1. A method for the non-machining manufacturing a bearing race comprising the steps of: punching a flat roundel from band material, forming by non-machine working a concentric annular groove into one of the two planar surfaces of the roundel, the opposite planar surface of the roundel being supported on a flat supporting surface and deep drawing the roundel into a bearing race having a floor section, in a die, with a punch concentrically engaging with its end face that portion of the roundel's planar surface encompassed by the annular groove, said punch having a punch diameter at its end face equal to or larger than the diameter of the radially inner edge and smaller

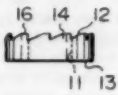
than the diameter of the radially outer edge of the annular groove.

4,437,215

THRUST BEARING WITH TAPERED LANDS

Shigehiro Nozue, Toyota; Tatsuhiko Fukuoka, Aichi, and Hideaki Sugiura, Okazaki, all of Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Division of Ser. No. 204,521, Nov. 6, 1980, Pat. No. 4,326,758. This application Feb. 4, 1982, Ser. No. 345,646
Claims priority, application Japan, Dec. 25, 1979, 54-167602
Int. Cl.³ B21D *53/10*
U.S. Cl. 29—149.5 R 3 Claims



1. A method of producing a thrust bearing having tapered lands formed in a bearing face of said bearing, comprising the steps of:

punching a half-completed bearing part from a metallic plate material by a press working, said half-completed bearing part having, on both sides thereof, annular bearing faces extending around a central bore for receiving therein a rotating shaft, said half-completed bearing part further having a plurality of said tapered lands disposed in at least either one of said annular bearing faces;

applying a hardening treatment to said bearing faces for hardening surfaces of said tapered lands;

lapping upper portions of said tapered lands for forming, in said upper portions, flat planes lying on an equal plane; and

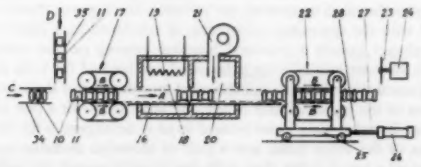
buffing said tapered lands having flat planes toward a predetermined circumferential direction so that said flat planes are gently angled and all acute angle corners of said tapered lands are rounded.

4,437,216

METHOD OF MANUFACTURING A HEAT EXCHANGER FOR COOLING AND HEATING PURPOSES

Karl G. Jonason, Västerås, Sweden, assignor to Granges Metallverken Aktiebolag, Västerås, Sweden

PCT No. PCT/SE79/00153, § 371 Date Mar. 12, 1980, § 102(e) Date Mar. 12, 1980, PCT Pub. No. WO80/00228, PCT Pub. Date Feb. 21, 1980
PCT Filed Jul. 11, 1979, Ser. No. 190,886
Claims priority, application Sweden, Jul. 13, 1978, 7807818
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 A 7 Claims



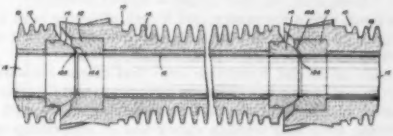
1. A method of manufacturing heat exchangers comprising tubes with substantially rectangular cross-section alternating with intermediate surface-enlarging means in the form of pleated thin metal strips, which are joined to each other by heating under mutual compression, the starting material used being tube element pieces and surface-enlarging means of predetermined length, the tube element pieces and surface-enlarging means mutually engaging with adjacent long sides in an advancing path, said method comprising: advancing a line of tubes alternating with surface-enlarging means through a heating zone and a cooling zone utilizing a first drive means acting in an advancing direction, uniting said tubes and said surface-enlarging means in said heating and cooling zones, and discharging united tube element pieces and surface-enlarging means from the cooling zone by means of a second drive, which is moved reciprocally as a unit in the path, the second drive means exerting a force on the line of tubes and surface-enlarging means acting opposite to the advancing direction so as to subject the line to a compressive force during advance of the line through the heating zone and the cooling zone, said metal strips having peaks brought into intimate contact with said tubes by heating during passage through the heating zone and by the compressive force.

4,437,217

COMPOSITE CERAMIC HEAT EXCHANGE TUBE

Paul G. Lallaye; John W. Bjerklie, and Robert A. Penty, all of Cape Elizabeth, Me., assignors to Hague International, Portland, Me.

Division of Ser. No. 150,888, May 19, 1980, Pat. No. 4,332,295. This application Feb. 1, 1982, Ser. No. 344,650
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.4 8 Claims



1. A method of fabricating a composite heat exchange tube having a porous thermal shock resistant ceramic main tube body, said method comprising the steps of, providing ceramic end inserts which are to form a seal at each end of the heat exchange tube and which are made of a more dense ceramic material than the main tube body, disposing the inserts in respective ends of the main tube body and depositing a thin ceramic liner within the main tube body, which liner is substantially impervious to fluids flowing within the tube at pressures at least up to 500 p.s.i.

4,437,218

PORTABLE OIL WELL TURBINE COLLAR REMOVING DEVICE

Whetstine B. Pridy, 2762 Blume, Los Alamitos, Calif. 90720

Filed Apr. 26, 1982, Ser. No. 372,211
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—240 10 Claims

1. An apparatus that includes an elongate chassis having forward and rearward ends onto which a length of oil well tubing having a collar secured on a first threaded end thereof may be positioned to have said collar removed therefrom, said removed collar transported to said rearward end of said chassis if found suitable for future use, said collar removably gripped on said rearward end and moved forwardly as said length of tubing is rotated to screw said collar on a second threaded end of said tubing, with said length of tubing then removed from said apparatus, said apparatus including:

a. a pair of longitudinally spaced transverse cross pieces supported on said chassis;

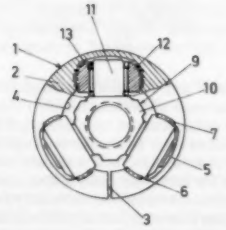
b. a first pair of transverse arms that extend outwardly from said chassis onto which arms said length of oil well tubing with said collar on said first end may be disposed to be rolled towards said chassis;
c. first means for receiving said length of tubing with said collar on said first end from said first pair of arms and lowering said length of tubing to rest on said pair of cross pieces where it may be rolled to a centered longitudinally extending position thereon;
d. second means for raising said length of tubing with said collar on said first end to a predetermined elevation above said chassis, with said collar adjacent said forward end of said chassis;
e. third means for rotating said length of tubing at said predetermined elevation;
f. fourth means for removably holding said collar stationary as said length of tubing is rotated at said predetermined elevation to unscrew said collar from said first threaded end;
g. fifth means for transporting said collar that has been removed from said length of tubing to said rearward end of said chassis;
h. sixth means for removably holding said collar stationary in a reversed position adjacent said rearward end of said chassis, said sixth means supported on said chassis and longitudinally movable thereon, said collar being screwed onto said second threaded end when said length of tubing is rotated and said sixth means is moved forwardly;
i. seventh means for raising said length of tubing with said collar on said second threaded end thereof to a first elevated position;
j. a pair of second transverse arms that extend outwardly from said chassis in a direction opposite to said first pair of arms, said second pair of arms receiving said length of tubing from said seventh means and so supporting said length of tubing with said collar on said second end that said length of tubing may be rolled outwardly on said second pair of arms to a position remote from said apparatus, with said first, second, third and seventh means at least being power operated;
k. power means for supplying power to said first, second, third and seventh means; and
l. manually operated control means for independently supplying power from said power means to said first, second, third and seventh means to permit them to operate independently of one another.

4,437,219

APPARATUS FOR RETAINING AND INSTALLING AN INTERIOR ASSEMBLY OF A UNIVERSAL JOINT

Jacques Dore, Colombes, France, assignor to Societe Anonyme Automobiles Citroen and Societe Anonyme Automobiles Peugeot, both of Paris, France

Filed Dec. 19, 1980, Ser. No. 218,308
Claims priority, application France, Dec. 20, 1979, 79 31323
Int. Cl.³ B23Q *1/00*
U.S. Cl. 29—283 **5 Claims**



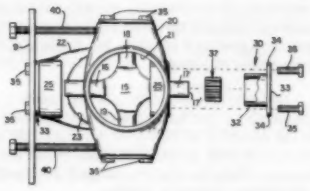
1. A retainer for the interior assembly of sliding universal joints of the type which includes an interior element constituted of a hub having at least two trunnions, a roller in the form of a spherical segment mounted on each trunnion, a substantially flat ring having sides, and of slightly elastically deformable material, said ring having a central opening and at least two inwardly opening recesses bordering said central opening and defined by the material of the ring, said central opening and recesses comprising a space to receive the assembled interior universal joint assembly within the ring, and seat means in each recess for engaging said rollers and maintaining said rollers in an assembled position on the trunnions, said seat means in each recess comprising, a pair of generally symmetrical elastically deformable spaced apart tongues connected to the material of the ring in the recess, each tongue having a concave interior surface, said concave surfaces facing toward each other to receive and engage a roller therebetween, said tongues projecting axially of the ring beyond the sides of the ring and terminating at ends spaced apart a distance slightly less than a diameter of the spherical segment of a roller so that the assembled interior assembly of the universal joint can be mounted in the retainer and can be removed from the retainer by moving the retainer axially relative to the assembled interior assembly of the universal joint.

4,437,220

METHOD AND APPARATUS FOR DISMOUNTING TRUNNION BEARINGS

Oran A. Gregory, 5334 N. Henry Blvd., Stockbridge, Ga. 30281

Filed Jul. 19, 1982, Ser. No. 399,708
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—426.5 **5 Claims**



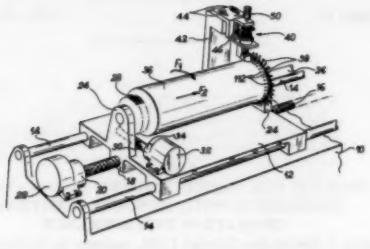
3. Apparatus for dismounting a trunnion bearing from a universal joint of the type having a crossed-pin member or spider to each pin of which member a yoke is mounted for pivotal movement by means of trunnion bearings having outer races secured to the arms of each yoke overlaying the ends of the pins and with each yoke arm having a pair of threaded holes straddling a pin of the crossed-pin member in which bolts may be threaded in securing the trunnion bearing race thereto, and with the apparatus comprising, in combination, a plate to be placed against a proximal trunnion bearing on one yoke with an inner pair of plate holes sized and located for bolts to be passed therethrough and threaded into the pair of threaded holes of the proximal arm of the one yoke and with a pair of outer threaded plate holes located so as to be aligned with the arms of the other yoke, and a pair of threaded dismounting bolts of a length more than sufficient to be threaded into said plate outer holes with the plate placed against the proximal trunnion bearing and into engagement with the other yoke arms, whereby the apparatus need be mounted to only one side of a universal joint in dismounting a trunnion bearing from the other joint side by threading the dismounting bolts into the plate against the other yoke arms until the trunnion bearing on the one yoke arm distal the plate has been urged at least partially therefrom.

4,437,221

PROCESS FOR INSERTING POINTS IN A MANDREL

Bruno Bompard, and Alain Bruyere, both of Lyons, France, assignors to Commissariat a l'Energie Atomique, Paris and Societe J. Brochier & Fils, Villeurbanne, both of, France

Filed Dec. 2, 1981, Ser. No. 326,755
Claims priority, application France, Jul. 16, 1981, 81 13868
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—429 4 Claims



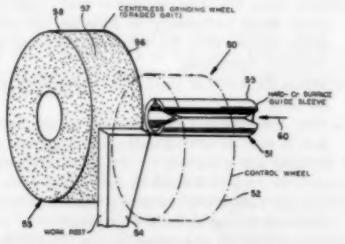
1. A process for the insertion of points to a supporting mandrel made at least in part form from a material able to receive the points by direct insertion under pressure in order to form rows of points aligned in accordance with the generatrixes of the mandrel, wherein it comprises rotating step by step the supporting mandrel, simultaneously making by means of a single working head a perforation for receiving a point and the insertion of a point in a perforation made beforehand in the same row and producing a given relative displacement parallel to the closet generatrix of the mandrel between the working head and the mandrel, at least once every complete revolution of the mandrel.

4,437,222

METHOD OF MANUFACTURING TAPE GUIDES FOR RECORDING AND/OR REPRODUCING APPARATUS

Yozaburo Umehara, 2-8-6, Shakujiimachi, Nerima-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 76,827, Sep. 19, 1979, abandoned, which is a division of Ser. No. 940,198, Sep. 7, 1978, Pat. No. 4,228,940. This application Aug. 18, 1981, Ser. No. 293,991
Claims priority, application Japan, Sep. 14, 1977, 52-124344[U]; Mar. 3, 1978, 53-24344
Int. Cl.³ B22D *11/126*
U.S. Cl. 29—527.4 15 Claims



1. A method of manufacturing a tape guide for tape cassette of a recording or reproducing apparatus, comprising the steps of:

(a) forming a base body of nonmagnetic material having a cylindrical surface;

(b) applying a surface layer of nonmagnetic hard material to said base body along said cylindrical surface;

(c) forming microscopic tips on said layer with the pattern of said tips extending substantially linearly in a direction transverse to the axial direction of said body so that said layer will have a surface roughness of 0.2 to 0.6 μRmax; and

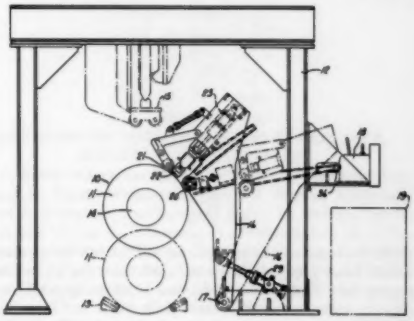
(d) fine-finishing the microscopic tips to round the same while substantially maintaining said surface roughness.

4,437,223

APPARATUS FOR DEBANDING COILED STRIP

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Mar. 5, 1982, Ser. No. 354,968
Int. Cl.³ B23P *23/00*; B23C *1/00*
U.S. Cl. 29—564.3 17 Claims



1. An apparatus for removing tightly encircling bands from the peripheries of coils of material, such as, coils of metallic rolled strip comprising:

support means for supporting a banded coil,

a frame having a first pinch roll transversely engageable with a band on a banded coil supported on said support means,

band severing means adjacent one side of said roll and including a cutting instrument with means for causing said cutting instrument to engage the band and sever it,

pinch means on said frame movable into engagement with said roll from said one side to pinch a severed band end therebetween, and

rotary drive means to rotate said roll such that a band pinched between said roll and said pinch means is fed outwardly away from a coil from which the band was severed.

4,437,224

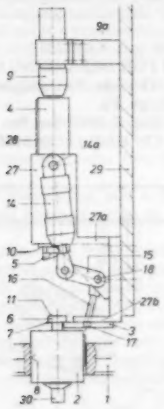
TOOL CHANGER FOR A REVOLVING CUTTING PRESS

Walter Bredow, and Gerhard Otto, both of Alfeld, Fed. Rep. of Germany, assignors to C. Behrens AG, Alfeld, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,151
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005667
Int. Cl.³ B23Q *3/155*
U.S. Cl. 29—568 13 Claims

1. In a revolving press, a combination comprising a press frame; a turntable turnably mounted on said press frame; tool holder means adapted to carry a punch, said tool holder means having an axis and being mounted in an opening of the turntable for reciprocation along said axis while being prevented from turning about said axis and movable with the turntable between a working and an exchange position; means connected to said press frame above said turntable for releasably engaging said tool holder means and means for moving the latter, when

in said exchange position, in direction of said axis into or out of said opening; said tool holder means including at an upper end thereof a tool holder head, said moving means comprising a guide member operatively connected to said press frame and having an axis parallel with said axis of the tool holder means in the exchange position of the latter, said guide member being movable along its axis while being prevented from turning



about the same and carrying at an end thereof facing said tool holder head gripping means movable between a position engaging said tool holder head and a releasing position; and support means mounted on said press frame and movable in a direction transverse to said axis of said tool holder means for supporting the latter when said gripping means is in said releasing position.

4,437,225

METHOD OF FORMING SOS DEVICES BY SELECTIVE LASER TREATMENT AND REACTIVE FORMATION OF ISOLATION REGIONS

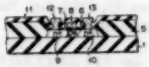
Yoshihisa Mizutani, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 21, 1982, Ser. No. 341,583

Claims priority, application Japan, Jan. 28, 1981, 56-11086

Int. Cl.³ H01L *21/263, 21/26*

U.S. Cl. 29—576 B **8 Claims**



1. A method of fabricating semiconductor devices comprising the steps of:

forming a non-single crystalline semiconductor layer on a single crystalline insulation substrate;

ion-implanting selectively material, which reacts with said semiconductor layer to form insulating material, into said semiconductor layer; and

applying an energy radiation or a heat treatment to said semiconductor layer, whereby the non-single crystalline semiconductor layer portion not implanted with said material is single crystallized with a seed of said single crystalline insulation substrate and at the same time the non-single crystalline semiconductor layer portion implanted with said material is rendered an insulation material.

4,437,226

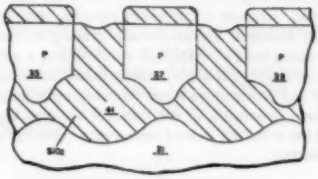
PROCESS FOR PRODUCING NPN TYPE LATERAL TRANSISTOR WITH MINIMAL SUBSTRATE OPERATION INTERFERENCE

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 239,749, Mar. 2, 1981. This application Dec. 16, 1982, Ser. No. 450,309

Int. Cl.³ H01L *21/31*

U.S. Cl. 29—577 R **1 Claim**



1. A method for forming an array of sub-micron dimensioned NPN-type lateral transistors on a substrate doped P-type, wherein each transistor is formed comprising the following steps:

masking the substrate to outline a pair of boundary regions for each semi-array of active regions to comprise a transistor;

slotting the substrate in said boundary regions to a given depth to form spaced apart slots removing any masking material from the substrate;

angle evaporating etch resist to cover the active regions of the substrate between slots; and the edges of said slots to a depth less than said given depth by way of the slots;

etching away the substrate below said depth less than the given depth sufficiently to separate the semi-arrays of active regions from the substrate except at spaced apart locations therealong;

oxidizing the substrate to fill in the portions etched away and the slots;

slotting the substrate orthogonally to the first mentioned slots to provide second slots with orthogonal pairs of slots defining active regions for the respective transistors;

doping the regions defined by orthogonal pairs of slots P+ through a single corresponding edge of each of the second slots and driving in the P+ doping;

doping of said last mentioned regions through both edges of each slot of said second slots N+ and driving in the N+ doping;

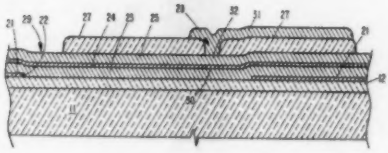
oxidizing the substrate to completely isolate said active regions from the substrate; and,

establishing electrical connections to the outer N+ regions and inner P+P region.

4,437,227
METHOD OF MAKING IMPROVED TUNNEL BARRIERS FOR SUPERCONDUCTING JOSEPHSON JUNCTION DEVICES

William E. Flannery, Norristown; Richard M. Josephs, Willow Grove; Barry F. Stein, Dresher; Tsing-Chow Wang, Norristown, and Peter L. Young, North Wales, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,386
Int. Cl.³ H01L *39/22*
U.S. Cl. 29—589 14 Claims



1. The method of manufacturing electrodes and a tunnel barrier junction therebetween for Josephson superconducting devices without removing the devices in process from a vacuum chamber, comprising the steps of:

providing an insulating substrate in a vacuum chamber,

evaporating and depositing on said substrate a base electrode layer of superconducting material comprising lead,

depositing over the exposed surface of said base electrode layer a tunnel barrier layer,

evaporating and depositing on top of said tunnel barrier layer the counter electrode layer of superconducting material comprising lead to complete two electrodes and a tunnel barrier layer therebetween without removing the substrate from said vacuum chamber,

said counter electrode layer being deposited in the presence of an inert gas atmosphere in said vacuum chamber at a partial vacuum pressure to provide a counter electrode layer which is vertically conductive and transversely non-conductive,

removing said substrate from said vacuum chamber,

providing a lift-off photoresist pattern on top of said counter electrode layer which defines the area of said counter electrode over the tunnel barrier junction of said Josephson superconducting devices,

returning said substrate to said vacuum chamber,

depositing an insulating layer on top of said counter electrode layer and said lift-off photoresist pattern,

removing said substrate from said vacuum chamber,

removing said lift-off pattern leaving areas of said counter electrode over said tunnel barrier junction exposed,

providing a photoresist pattern comprising an open aperture over portions of said counter electrode layer which is over said tunnel barrier junctions,

returning said substrate to said vacuum chamber, and

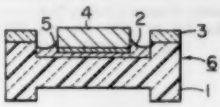
depositing a conductive path in said open aperture of said photoresist pattern to provide a Josephson junction superconducting device.

4,437,228
METHOD OF MOUNTING A SILICON PELLET ON A CERAMIC SUBSTRATE

Hideharu Yamamoto, Tokyo, and Hiroshi Tsuneno, Sayama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,863
Claims priority, application Japan, Oct. 1, 1980, 55-135869
Int. Cl.³ H01L *21/58*
U.S. Cl. 29—590 7 Claims

7. In a method of manufacturing a semiconductor device in which a silicon pellet is bonded to an insulation substrate by means of a glass material of a low melting point, the improvement comprising forming an adhesion reinforcing film which has a good wettability to said glass material of low melting point and exhibits a bonding strength in cooperation with said

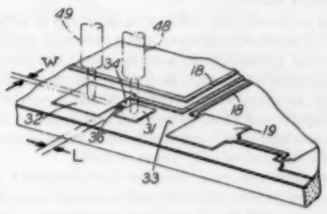


glass material, which strength is greater than that of said silicon pellet, on a lower surface of said silicon pellet to which said glass material of low melting point is to adhere.

4,437,229
METHODS OF MARKING AND ELECTRICALLY IDENTIFYING AN ARTICLE

Joel R. Bitler, Allentown; Michael W. Bodnar, Macungie; Raymond H. Booth, Walnutport; Daniel J. Roman, Bethlehem; Fred J. Schneider, Northampton; Philip W. Seitzer, Bethlehem, and George F. Wilkinson, Jr., Northampton, all of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 101,042, Dec. 6, 1979, Pat. No. 4,344,064.
This application May 24, 1982, Ser. No. 381,129
Int. Cl.³ G01R *17/00*
U.S. Cl. 29—593 3 Claims



1. A method of making electronic articles, said articles including substrates and circuit elements supported by such substrates, wherein said circuit elements are tested and said articles are selectively grouped and marked based on the outcome of such tests, which comprises:

forming at least one distinct resistive element of a first relatively low resistive value on each such substrate, said at least one distinct resistive element being functionally separate from any such circuit elements, said first resistive value of said at least one resistive element identifying such article as one of a first group of at least two groups of said articles as may be determined by said tests;

testing said articles;

applying energy to at least one such distinct resistive element on the substrate of any of said tested articles with respect to which such testing has determined that such articles are not of such first group, such energy altering said first resistive value to a second relatively high resistive value with respect to such first resistive value; and

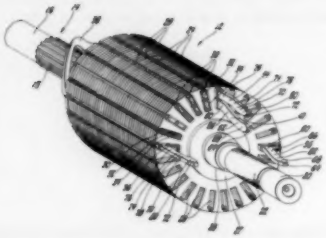
prior to further steps involving a selective treatment of the articles of such first group, measuring the resistive value of such at least one distinct resistive element of such tested articles to determine whether such articles are of such first group of articles.

4,437,230

MOTOR HAVING INSULATIONLESS ARMATURE CONNECTIONS

Hans Greutmann, Toledo, Ohio, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 19, 1982, Ser. No. 399,665
Int. Cl.³ H02K 15/09
U.S. Cl. 29—597 6 Claims



1. A method of manufacturing a rotor for a dynamoelectric machine, comprising the steps of:

providing an armature shaft having a slotted armature core mounted thereto;

placing a plurality of conductive windings in slots of said slotted armature to form at least a two-layer winding, each said slot containing at least an upper conductor and a lower conductor, each said upper conductor having an upper terminal portion and each said lower conductor having a lower terminal portion, said upper terminal portion and said lower terminal portion being disposed adjacent a first end of said armature shaft;

bending each said lower terminal portion toward said shaft at a first portion adjacent said armature core and away from said shaft at a second portion adjacent a free end of said lower terminal to form a first body portion directed towards said shaft and a first end portion parallel to said shaft;

bending each said upper terminal portion away from said shaft at a third portion adjacent a free end of said upper terminal portion and bending each said upper terminal portion towards said shaft at a fourth portion adjacent said third portion and distal to said armature core to form a second body portion parallel to said shaft, a first transition portion directed toward said shaft, and a second end portion parallel to said shaft;

installing a commutator on said armature shaft adjacent said first end of said shaft;

urging each said second end portion radially towards said shaft to force each said second end portion against each said first end portion and to force each said first end portion against said commutator, each said first body portion and each said second body portion defining a gap therebetween; and

bonding said second end portion to said first end portion and bonding said first end portion to said commutator;

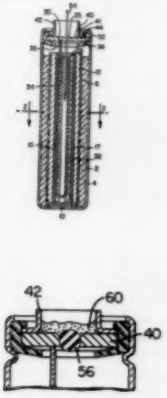
whereby said rotor may be manufactured without the provision of an insulating body between said upper terminal portion and said lower terminal portion.

4,437,231

METHOD OF MAKING AN ELECTROCHEMICAL CELL HAVING A SAFETY VENT CLOSURE

Ronald L. Zupancic, Parma Heights, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 190,990, Sep. 26, 1980, Pat. No. 4,329,405.
This application Feb. 2, 1982, Ser. No. 344,944
Int. Cl.³ H01M 2/12
U.S. Cl. 29—623.2 3 Claims



1. A method for assembling an electrochemical cell having a safety vent closure which comprises the steps:

(a) providing a metal cell housing comprising a container having an open end, a closed end and an upstanding circumference;

(b) inserting a cathode collector shell into said container, said cathode collector being in contact with the inner upstanding circumference of the container thereby adapting the container as the positive terminal of the cell;

(c) disposing a separator within and in contact with the inner circumference of the cathode collector shell;

(d) inserting a multimember anode comprised of a first half-cylindrical annular member and a second half-cylindrical annular member, each of said members have an inert electrically conductive metal screen disposed against their inner surface wall, said first and second cylindrical half annular members being disposed in an opposing fashion such that an axial cavity is formed therebetween;

(e) disposing an electrically conductive spring strip into the axial cavity between the screen-backed anode members such that said strip resiliently biases the two anode members via said strip so as to provide a substantially uniform and continuous pressure contact over the inner wall of the anode members;

(f) securing a first metal cover over the open end of said housing, said first cover having at least one vent orifice;

(g) securing a second metal cover to the open end of the cell's housing and placing said second metal cover over said first metal cover wherein at least one metal tubular member is secured to said second cover and surrounds the vent orifice defined in said first cover;

(h) feeding the liquid cathode/electrolyte of the cell through the vent orifice into the housing;

(i) force fitting a deformable member into the vent orifice thereby providing a fluid-tight seal over said vent orifice; and

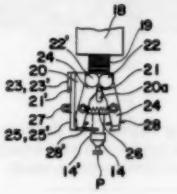
(j) placing a layer of sealant having adhesion to metal within said metal tubular member over the deformable member and the area of the first metal cover defining the vent orifice and surrounded by the tubular member.

4,437,232

ELECTRONIC PARTS MOUNTING APPARATUS

Shigeru Araki, Katano; Yasuo Taki, Hirakata; Kazuhiro Mori; Yoshihiko Misawa, both of Katano, and Souhei Tanaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 115,279, Jan. 25, 1980, Pat. No. 4,327,482.
This application Feb. 22, 1982, Ser. No. 351,312
Claims priority, application Japan, Jan. 25, 1979, 54-7764
Int. Cl.³ H05K *3/34, 13/04*
U.S. Cl. 29—740 1 Claim



1. An apparatus for carrying and placing components onto a board or the like, comprising:

a body frame fixed at a position on a plane;

a rod means movably supported on said body frame for movement in vertical and horizontal directions with respect to the plane;

a first movable means connected to said rod means for moving said rod means in the vertical direction with respect to the plane;

a second movable means connected to said rod means for moving said rod means in the horizontal direction with respect to the plane;

a suction tool provided at a lower end of said rod means for picking up a component;

a suction means connected to said suction tool for supplying a vacuum to said suction tool when said suction tool is carrying a component;

at least one pair of positioning pawls rotatably mounted on said rod means and having free ends for grasping and positioning a component therebetween when the free ends are moved towards each other;

means for rotating said positioning pawls in synchronization with the movement of said rod means for causing the free ends to move away from each other when said rod means is in a lowered position to pick up a component and for causing the free ends to come close to each other when said rod means is in a raised position to bring the free ends into engagement with a component picked up by said suction tool; and

a pair of electrodes, one on each of the positioning pawls for contacting each other and abruptly conducting a predetermined level of current therebetween when said free ends of said positioning pawls move clower to each other than they move when a component is located therebetween, whereby an instantaneous signal indicating the absence of a component is directly produced.

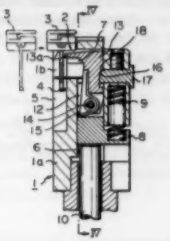
4,437,233

FASTENER SLIDER HOLDING DEVICE

Keiichi Yoshieda, and Yoshitaka Iimura, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 283,107
Claims priority, application Japan, Aug. 8, 1980, 55-112489
Int. Cl.³ A21H *37/06*
U.S. Cl. 29—768 6 Claims

1. A fastener slider holding device comprising a fastener slider holder having a slider mount on an upper portion and a recess in a lower portion on one side thereof, a spring-loaded sliding member slidably mounted in said slider holder for upward and downward movement and normally biased downwardly, a slider holding lever rockably mounted in said slider holder and having an engaging pawl at the forward end thereof, an operation rod for moving said sliding member upwardly and downwardly and means associated with said sliding member for rocking said slider holding lever between a



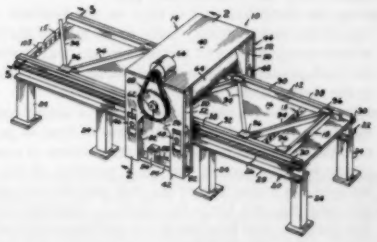
first position in which said engaging pawl completely disengages from a pull tab located on a slider when said slide holding lever moves upwardly and a second position in which said engaging pawl engages in the hole in said pull tab when said rocking member moves downwardly.

4,437,234

TRUSS ASSEMBLING GANTRY

Jack L. Thornton, P.O. Box 222400, Carmel, Calif. 93922

Filed Jan. 15, 1982, Ser. No. 339,534
Int. Cl.³ B23P *19/00, 11/00*
U.S. Cl. 29—798 6 Claims



1. A truss joist assembling apparatus, comprising:

platform means including an elongated planar bed for supporting truss joist components when disposed thereon in a predetermined truss configuration, said platform means further including,

roller track means including flanged beams disposed at longitudinal sides of said bed defining horizontal vertically spaced confronting surfaces;

upstanding track means extending longitudinally of said bed adjacent its respective longitudinal sides for forming, in combination with said bed, lateral and vertical boundary limits of a truss joist;

gantry means including a drum overlying said upstanding tracks for movement longitudinally of said platform means, said gantry means further including,

vertical frame means disposed on opposing sides of said platform,

said drum having a shaft journalled by said vertical frame means; and,

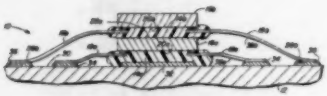
a plurality of pressure roller means vertically movably supported by said vertical frames in contact with said roller track means for vertically moving said drum toward and away from said upstanding track means.

4,437,235

INTEGRATED CIRCUIT PACKAGE

Chandler H. McIver, Tempe, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Division of Ser. No. 221,103, Dec. 29, 1980, Pat. No. 4,363,076.
This application Aug. 23, 1982, Ser. No. 410,234
The portion of the term of this patent subsequent to May 3, 2000, has been disclaimed.
Int. Cl.³ H05K 3/34
U.S. Cl. 29—840 1 Claim



1. Method of mounting an integrated circuit chip having an active face having outer edges, a back face and a plurality of input/output terminals on the active face thereof with a plurality of flexibe beam leads, each of said leads having an inner and an outer lead site, with the inner lead site of each lead being bonded respectively to an input/output terminal of the integrated circuit chip, on a substrate having a top surface with a chip pad formed on the top surface and a plurality of outer lead pads associated with the chip pad comprising the steps of:

preheating the substrate to a first temperature range at which a given thermosetting plastic becomes tacky;

placing a preform comprised of a segment of the web coated with the thermosetting plastic which plastic is electrically insulating and thermally conductive on the chip pad to cause the preform to adhere to the pad, said preform substantially covering the chip pad;

placing the integrated circuit chip on the preform, active face down, and applying a force to the back of the chip to initiate encapsulation of the active face, and portions of the leads proximate the input/output terminals of the chip in the thermosetting plastic of the preform;

heating the substrate, chip and preform to a second temperature for a first predetermined period of time to partially cure the thermosetting plastic of the preform to cause the plastic to flow around the inner portions of the leads between the active face of the chip and the chip pad;

positioning the chip while the plastic is partially cured so that the outer lead bonding site of each beam lead substantially overlies the outer lead pad to which it to be bonded;

thermocompressively bonding the outer lead bonding sites of the leads to the outer lead pads to place the leads under compression; and

heating the thermoplastic material to a third temperature for a second predetermined period of time to substantially cure the thermosetting plastic.

4,437,236

SOLDER BONDING PROCESS

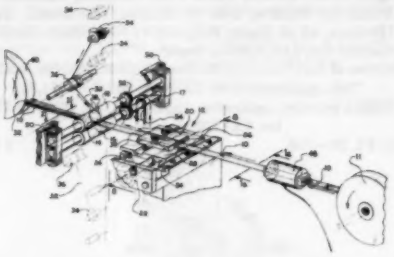
Joseph A. Oswald, Jr., Mechanicsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 25, 1982, Ser. No. 342,715
Int. Cl.³ H01R 43/02
U.S. Cl. 29—879 8 Claims

1. Process for producing an electrical terminal from flat metal stock coated with a thin layer of solder, tin, gold, gold alloys, palladium or palladium alloys comprising

a. feeding the coating metal stock into a nip of at least one pair of pressure rollers from a strip guide means, said strip guide means controlling the position of the metal stock between the rollers,

b. cold rolling solder wire onto the metal stock at ambient temperature without the presence of a flux on the metal stock as it is fed between the pressure rollers, the nip between the rollers having a gap slightly larger than the thickness of the metal stock, and



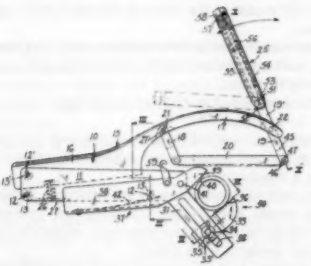
c. thereafter stamping and forming the metal stock to produce an electrical terminal with a thickened solder layer in a predetermined location on the terminal.

4,437,237

SWING SAW FOR CUTTING METAL CONDUIT

Lucien C. Ducret, 28 Lockwood Dr., Old Greenwich, Conn. 06870

Filed Aug. 6, 1982, Ser. No. 406,104
Int. Cl.³ B27B 19/14
U.S. Cl. 30—90.2 10 Claims



1. A hand tool for cutting elongated materials comprising,

an elongated body portion having a forward end, a rear end and a clamping jaw supporting extension,

an elongated saw blade supporting element having a handle portion and being pivotally mounted on the body portion adjacent the rear end of said portion, for movement of said blade supporting element in a plane perpendicular to its pivoting axis,

an elongated saw blade,

means connecting said blade to the blade supporting element,

means for effecting cutting motion of the blade in said perpendicular plane relative to the blade supporting element,

a first clamping jaw adjustably mounted on said jaw supporting extension,

a clamping lever comprising an elongated handle portion and at least one forwardly positioned second clamping jaw means, and

means pivotally mounting said lever on the body portion adjacent the forward end thereof,

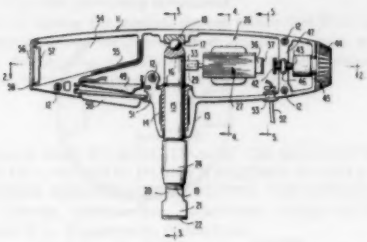
the body portion, the handle portion of the blade supporting element and the handle portion of the clamping lever being so juxtaposed that they can be grasped by one hand of a tool operator for simultaneously clamping the work and biasing the saw blade toward said work in a cutting plane perpendicular to the pivoting axis of the blade supporting element.

4,437,238

TOOL FOR SEVERING LEAD CANING

John P. Coleman, 5920 Georgia Ave., N.W., Washington, D.C. 20010

Filed Feb. 24, 1982, Ser. No. 352,055
Int. Cl.³ B26B 7/00
U.S. Cl. 30—272 A 11 Claims



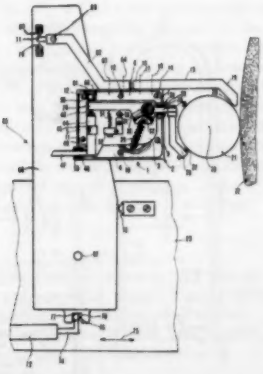
1. A tool for severing lead canning and the like comprising a body portion forming a handle, a shaft journaled on the body portion and projecting therefrom substantially normal to the axis of said body portion, power means operatively coupled with the shaft causing it to oscillate rapidly around the longitudinal axis of the shaft, and a blade fixed to the leading end of the shaft and having a leading cutting edge extending at right angles to and on opposite sides across the axis of oscillation of the shaft, whereby downward pressure on said handle is transmitted axially along the longitudinal axis of said shaft and axially to said leading cutting edge during the cutting operation.

4,437,239

GAUGE FOR THE DIMENSIONAL CHECKING OF A MECHANICAL PIECE

Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Dec. 23, 1981, Ser. No. 333,935
Claims priority, application Italy, Dec. 23, 1980, 3599 A/80
Int. Cl.³ G01B 7/12
U.S. Cl. 33—143 L 14 Claims



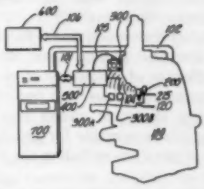
1. A gauge for the dimensional checking of a mechanical piece, comprising an enclosed support, a gauging arm movable with respect to the support, a feeler element connected to the arm to touch the piece to be checked, connection means including a first element fixed to the arm, a second element fixed to the support, and resilient means, the first and the second element allowing limited rotatory gauging displacements of the arm with respect to the support, said resilient means being coupled to the arm and the support for maintaining in firm contact the first and the second elements, in order to define a geometrical axis of rotation for the arm, that is stationary with respect to the support, and detection means associated with the arm and the support, wherein the first element of the connection means defines a portion of a substantially cylindrical surface and the second element includes two edges adapted to remain in contact with two generating lines of the portion of the cylindrical surface, said geometrical axis being defined by the intersection of two geometrical planes passing through said generating lines and being perpendicular to the portion of the cylindrical surface.

4,437,240

TELEMETRY GAGE SYSTEM

Richard O. Juengel, Romeo; John D. Begin, Warren, and John Khalaf, Livonia, all of Mich., assignors to The Valeron Corporation, Troy, Mich.

Continuation of Ser. No. 182,226, Aug. 28, 1980, Pat. No. 4,320,623. This application Nov. 9, 1981, Ser. No. 319,129
The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.
Int. Cl.³ G01B 7/02
U.S. Cl. 33—172 E 3 Claims



1. In a system having at least one movable member operative to perform various tasks upon a workpiece using various components selected from a component storage device, at least one of the components comprising gaging means for performing gaging of the workpiece as preselected ones of the various tasks, the gaging means being wirelessly associated with and having a housing body shaped so as to be held by the movable member during gaging of the workpiece and held by the storage device when not being used for gaging, the gaging means including transducer means mounted in the housing body operative for generating an electrical signal related to a dimensional characteristic of the workpiece whenever the housing body is moved by the member to a predetermined position relative to the workpiece, the improvement comprising:

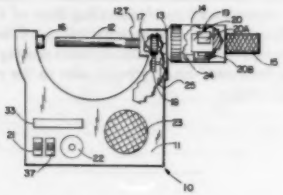
converter means in the housing body comprising switching means having a control input coupled to the transducer mean for receipt of the electrical signal and a plurality of light emitting diodes coupled to the switching means and mounted about a peripheral portion of the housing body, the switching means operative upon receipt of the electrical signal to cause the plurality of light emitting diodes to emit an optical signal substantially in a 360 degree pattern from the housing body; and

receiver means separate from the housing means, positioned at any point intersected by the 360 degree pattern of optical signal emission for remote reception of the optical signal and for converting the optical signal to an output signal indicative of the dimensional characteristic.

4,437,241
MEASURING INSTRUMENT AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 68,609, Aug. 22, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 275,630
Int. Cl.³ G01B 3/18
U.S. Cl. 33—166 18 Claims



1. A measuring instrument comprising:

a support,

first and second work surface contacting means supported by said support,

means for moving said first surface contacting means with respect to said support and an article positioned between said first and second surface contacting means to cause said first surface contacting means to engage a first portion of the surface of said article while an opposite portion of said article is engaged by said second surface contacting means,

means for sensing movement of said first surface contacting means and generating an electrical analog signal which varies in accordance with the movement of said first surface contacting means,

analog-to-digital conversion means for receiving and digitizing said electrical analog signal and generating digital signals indicative of the degree of movement of said first surface contacting means with respect to said support,

microminiature electronic circuit synthetic speech signal generating means operable for generating speech signals of words of numbers including the numbers "0" to "9", and

first control signal generating means connected between said analog-to-digital conversion means and said microminiature electronic speech signal generating means for receiving digital signals generated on the output of said analog-to-digital conversion means and operable to output control signals for controlling the operation of said microminiature electronic circuit synthetic speech signal generating means to cause the latter to generate a chain of synthetic speech signals defining a sequence of numbers which are indicative of measurements made by said device,

force sensing means connected to said first surface contacting means and operable to generate a measurement indicating control signal upon sensing a force applied between said first surface contacting means and a workpiece, and

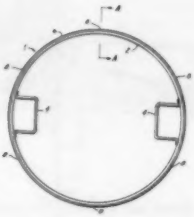
means for applying said measurement indicating control signal to said first control signal generating means to cause the latter to control the operation of said microminiature electronic circuit synthetic speech signal generating means to generate a plurality of synthetic speech signals which are indicative of the distance between said first and second surface contacting means when a workpiece is disposed therebetween and said first and second surface contacting means are in contact with opposite surfaces of said workpiece and when said first surface contacting means engages one surface of said workpiece with a predetermined, and

means for receiving and transducing said synthetic speech signals to sounds of words defining a sequence of numbers which indicate the measurement made by said measuring instrument.

4,437,242
FLEXIBLE GAUGE FOR INSIDE DIMENSIONS

Billy J. Battle, Birmingham, Ala., assignor to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Aug. 30, 1982, Ser. No. 412,427
Int. Cl.³ G01B 3/50
U.S. Cl. 33—178 B 3 Claims

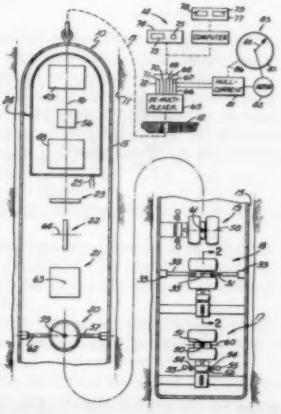


1. A gauge for determining the acceptance or rejection of a cylinder having a predetermined opening, said predetermined opening of said cylinder having a permissable tolerance variation from a predetermined minimum inner diameter thereof, said gauge comprising a first flexible cylindrical sleeve and a second flexible cylindrical sleeve, said first flexible cylinder forming a partial interior liner for said second flexible cylindrical sleeve and being attached to said second flexible cylinder in an underlying relationship, said first flexible cylindrical sleeve having an outer diameter equal to the minimum permissible inner diameter of said opening in said cylinder and said second flexible cylindrical sleeve having a thickness equal to one-half the permissible tolerance variation of said opening in said cylinder.

4,437,243
GYROSCOPIC INSTRUMENT

Robert L. Brown, Buena Park, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 20, 1981, Ser. No. 235,931
Int. Cl.³ G01C 19/38, 19/28, 19/26
U.S. Cl. 33—302 21 Claims



1. The combination comprising:

a body;

a gyroscopic rotor carried by said body and driven rotatively relative thereto about a spin axis;

a connection mounting said rotor to said body in a relation

transmitting pivotal movement about a sensing axis through the body to the rotor and enabling precessing movement of the rotor relative to the body about an axis of precession in response to said pivotal movement about the sensing axis;

a caging means for retaining said rotor against precessing movement from an initial position and releasable to free the rotor for precessing movement;

means for timing the interval during which said rotor precesses from said initial position to another position, and

means for deriving an indication of the rate of precession from the time required for said precession.

4,437,244

METHOD FOR SUCKING UP SOIL OR SLUDGE BY MEANS OF A SUCTION HOPPER DREDGE AS WELL AS A SUCTION DREDGE FOR APPLYING THE METHOD

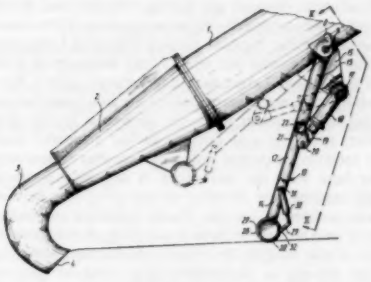
Pieter Verboom, Alblasserdam, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Sep. 16, 1982, Ser. No. 418,673

Claims priority, application Netherlands, Sep. 17, 1981, 8104293

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—63 **3 Claims**



1. In a suction dredge having a suction pipe and drag head and provided with loosening means for loosening soil or sludge positioned in front of the inlet opening of the drag head seen in the dragging direction; the improvement in which said loosening means are disposed at such a distance from the inlet opening of the drag head that the gases liberated by the loosening operation remain substantially out of the suction action of the drag head, said loosening means being secured to a frame which extends downwardly from the suction pipe a substantial distance from the inlet opening of the suction pipe, said loosening means comprising a plurality of injection nozzles, and means acting between said frame and said pipe for swinging said frame upwardly to a raised inoperative position and downwardly to a lowered operative position about a horizontal pivot by which said frame is secured to said pipe.

4,437,245

MEANS FOR MAKING A SKI TRAIL

Tapio Nigmela, Linnatie 10D5, Kittila, Finland 99100

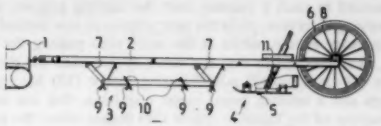
Filed Nov. 19, 1982, Ser. No. 443,162

Claims priority, application Finland, Dec. 3, 1981, 813868

Int. Cl.³ E01H *4/00*

U.S. Cl. 37—222 **3 Claims**

1. A ski trail making apparatus comprising a frame, adapted for attachment e.g. behind a snowmobile, a drag for levelling out old ski trails and tracks, linkage arms pivotally attached to the frame for suspending the drag therefrom, said drag being adjustable in the vertical direction and free to rise upwardly if an obstacle is encountered, a trail planer having trail making blades located side-by-side on said frame disposed behind said drag, means for resiliently mounting said trail planer on said frame, and a cylindrical levelling roll having projecting trail



groove depressor rims thereon disposed behind said trail planer for supporting said apparatus.

4,437,246

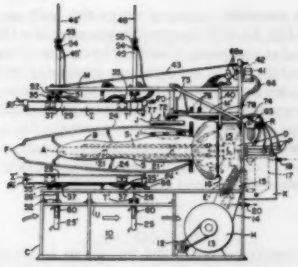
PRESSING AND CREASING APPARATUS

John R. Sanko, Altoona, Pa., assignor to Paris Manufacturing Company, Inc., Brockway, Pa.

Filed Oct. 7, 1981, Ser. No. 309,242

Int. Cl.³ D06F *71/40*; D06C *5/00*

U.S. Cl. 38—25 **11 Claims**



1. In a finishing machine for a pants-like garment having a support base, a longitudinal-horizontally extending permeable bag carried by said support base for receiving and positioning a garment therealong, means for applying hot steam and air through said bag to the inside of the garment to expand it, means carried by said support base for internally engaging and then folding-over material of the expanded garment to form preliminary creases therealong, means for thereafter applying heat and externally applying pressing force to the preliminary creases for forming final creases along the material of the garment, and said means for folding-over material of the expanded garment having means for moving it out of engagement with the material before pressing force is externally applied to the preliminary creases by said second-mentioned means.

4,437,247

APPARATUS FOR FEEDING LAUNDRY TO AN IRONING MACHINE

Wilhelm Wiebesiek, Vlotho, Fed. Rep. of Germany, assignor to Herbert Kanneglesser GmbH & Co., Voltho, Fed. Rep. of Germany

Filed Apr. 27, 1982, Ser. No. 372,350

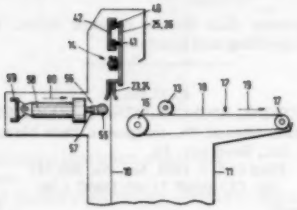
Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119600

Int. Cl.³ D06F *67/04*

U.S. Cl. 38—143 **12 Claims**

1. Apparatus for feeding laundry articles to an ironing machine or the like, wherein the laundry articles are suspended on two grippers of a conveyor device disposed transversely in front of and offset in height in relation to a feed conveyor leading to the ironing machine and, starting from an operating station (A) situated at the side of the working width of the feed conveyor, are conveyed by the conveyor device to a position

centrally in front of the loading position of the feed conveyor, and wherein the two grippers of the conveyor device are disposed on a rope drive capable of controlled driving and can be moved in such a manner that the leading gripper, in the conveying direction, pulls the rear gripper in tow behind it via the laundry article, while at the same time pulling the latter taut, characterised in that the drive device used for the rope drive (14) is a geared polechanging motor (15) having two speeds and a smooth speed range transition, that the towing conveying of the laundry article (10) begins when the geared



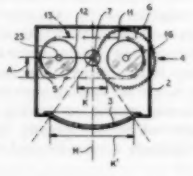
motor (15) is smoothly changed up to the high speed, that switch means (51, 52, 53) changes the geared motor (15) down to its low speed at a moment of time in the course of the towing conveying, and that after the complete tensioning and centering of the laundry article (10), which are effected at low speed, the geared motor (15) remains switched on at a predetermined torque adjusted to the transioning or tautening force acceptable for the laundry article (10) and at zero rotational speed, for the purpose of maintaining the tensioning, until the laundry article is transferred to a feed conveyor (12).

4,437,248

VIEWER SIMULATING TELEVISION RECEIVER

Hubertus Ramme, Graf-Adolfstrasse 25, 5758 Fröndenberg, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,466
Int. Cl.³ G03B *1/00*
U.S. Cl. 40—364 **11 Claims**



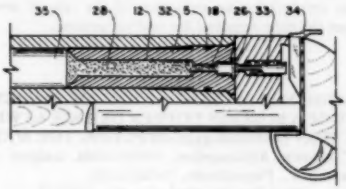
1. A viewer simulating a television receiver, comprising:
a housing;
a substantially punctiform light source in said housing;
a light-diffusing screen in a wall of said housing centered on an axis, said light source being located on said axis at a distance from said screen;
a supply of operating current connectable to said light source; and
transport means in said housing for supporting a coherent transparent carrier of positive images in an area between said screen and said light source for translumination by divergent rays from the latter and enlarged direct projection upon said screen, said transport means including an actuator accessible from outside said housing for advancing said carrier along a path crossing said axis at an intersection separated from said light source by less than half of said distance, said housing being devoid of any focusing lens, said carrier being the only element traversed by said rays between said light source and said screen.

4,437,249

CONVERSION OF MODERN SHOTGUNS INTO MUZZLELOADING SHOTGUNS

James R. Brown, 9181 Tarbutton Rd., South Vienna, Ohio 45369, and Karlis A. Sirons, 2482 Fox Hollow Rd., Springfield, Ohio 45502

Filed Mar. 18, 1982, Ser. No. 359,272
Int. Cl.³ F41C *21/10*
U.S. Cl. 42—51 **1 Claim**



1. A conversion plug for removable insertion into a standard, unmodified shotgun having a conventional chamber and barrel for converting the shotgun into a muzzleloading firearm, said plug comprising: a cylindrical rear portion conforming to the shape of the shotgun chamber and having a tapered rear shoulder for engaging a cartridge rim receiving portion of the chamber; a reduced diameter forward portion extending forwardly from the plug rear portion into close fitting engagement with the bore of the shotgun barrel; said plug forward portion having a main bore with an outward flare at the front end thereof for receiving black powder when the firearm is loaded as a muzzleloader; said plug rear portion having a tapered bore therein for receiving a primer and a passageway connecting said primer bore with the main bore in said plug forward portion; said tapered rear shoulder of said plug rear portion having a circumferential cut-out therein allowing an ejector mechanism of said shotgun to bypass said plug, thereby avoiding ejection of said plug by the ejector mechanism; said plug rear portion having a circumferentially oriented groove therein and an annular sealing means in said groove; and said plug rear portion having a tapered slot in the rear end thereof intersecting said primer bore for aiding in the removal of a primer positioned in said primer bore.

4,437,250

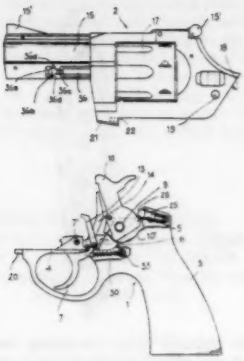
REVOLVER

Pier C. Beretta, Brescia, Italy, assignor to Fabbrica d'Armi P Beretta S.p.A., Italy

Filed Jul. 16, 1981, Ser. No. 283,819
Claims priority, application Italy, Jul. 18, 1980, 5187 A/80
Int. Cl.³ F41C *1/00*
U.S. Cl. 42—59 **13 Claims**

1. A revolver of the type having an opening for the lateral displacement of a rotatable drum and comprising a body including first and second main members that are removably connected to each other, said first member comprising a handle and an underguard and a snap-firing mechanism defined by at least a trigger and a hammer, said second member comprising a stem, a barrel, sighting means, a firing pin and a rotatable drum with means for blocking and unblocking thereof, characterized in that at the extremity of said underguard of said first member there is provided a tongue for mortise-like engagement in a seat provided in a shoulder arranged at the base of said second member, an upper part of said handle and a rear terminal of said second member being provided with corresponding and mating inclined surfaces, said handle and said second member have coaxial transverse openings for the acceptance of an arresting spine for the mutual blocking of said first and second members, and means for eliminating play between said second member and said handle, said transverse openings for said arresting spine coinciding with an axis of

rotation of said hammer, said axis being defined by a sleeve pin transversely mounted between two ears provided in the upper



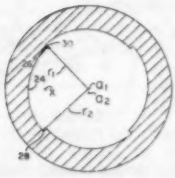
part of said handle, said openings provided in said second member being coaxial with said sleeve pin.

4,437,251

FULL GAIN TWIST RATCHET RIFLING

Richard M. Gorman, 3420 W. Danbury St., Apt. C-106, Phoenix, Ariz. 85023

Continuation-in-part of Ser. No. 130,383, Mar. 14, 1980, Pat. No. 4,308,681. This application Dec. 21, 1981, Ser. No. 332,801
The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.
Int. Cl.³ F41C *21/00*
U.S. Cl. 42—78 **10 Claims**



9. In a rifled barrel with means for seating a projectile therein, said rifled barrel having minor and major-radius portions measured from the bore-axis, and having therebetween spin-imparting edges on the rifling, in combination: improved ratchet rifling with a full gain twist in the form of a bore portion having a smooth bore for initially receiving and holding a projectile without marring the projectile followed by a gradually emerging ratchet rifling contour with each spin-imparting edge being progressively deepened by said minor-radius portions "falling" inward toward said bore axis and producing a projectile-seating increasing in predetermined proportion to twist along the barrel.

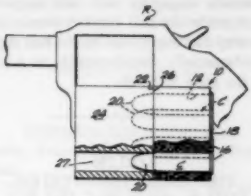
4,437,252

RAPID LOADING DEVICE FOR A REVOLVER

Carlos E. Castellanos Manero, Miami, Fla., assignor to Aida Castellanos Kwasniak, Miami, Fla.

Filed Jan. 16, 1981, Ser. No. 225,629
Int. Cl.³ F42B *39/04*
U.S. Cl. 42—89 **5 Claims**

1. A rapid loading device for a revolver comprising, a generally cylindrical member formed of a conventional synthetic cellular foam material having a very great compressibility quality, said cylindrical member including a plurality of longitudinally extending through holes therein, to coincide with the



chambers in a revolver cylinder, for the reception of an ammunition cartridge in each of said chambers.

4,437,253

FISHERMAN'S HAND TOWEL AND METHOD

Duane W. Kinnear, R.D. 1,, East Springfield, Pa. 16411

Filed Apr. 4, 1983, Ser. No. 481,918
Int. Cl.³ A01K *97/04*
U.S. Cl. 43—1 **8 Claims**

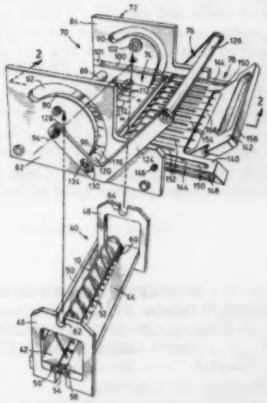
1. A fisherman's towel for wiping hands at a fishing site immediately before handling bait in the process of each baiting of a line to prevent the bait from acquiring human odors from such handling, said towel consisting essentially of a piece of damp toweling impregnated with an amount of anise odor containing substance which leaves a residual anise odor on the fisherman's hands which is in part picked up by the bait in amount sufficient to mask any of said human odor acquired by the bait from said handing.

4,437,254

LONGLINE BAITING

Everett G. Fancey; John V. Peters, and Russell E. Tucker, all of St. John's, Canada, assignors to Nordco Limited, St. John's, Canada

Filed Jun. 26, 1981, Ser. No. 277,912
Int. Cl.³ A01K *79/00, 83/00, 91/00*
U.S. Cl. 43—4 **20 Claims**



1. A fish hook baiter comprising,

(a) a hook support means having a hook supporting portion of its length adapted to support a gang of hooks in a side-by-side spaced relationship which is fixed for baiting with their hook ends free for baiting,

(b) bait support means adapted to support bait during hooking of the bait, said bait support means being disposed

laterally opposite and co-extensive with at least a portion of said hook supporting portion of said hook support means,

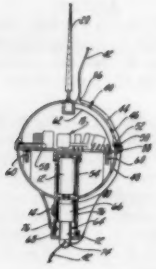
(c) guide means engaging said bait support means and adapted to guide the bait support means along a baiting path whereby bait supported on the bait support means is applied substantially simultaneously to a plurality of the hooks in the gang of hooks.

4,437,255

FISH DETECTING SYSTEM

Dorian Reed, 13231 Northfield Blvd., Oak Park, Mich. 48237

Filed Apr. 23, 1982, Ser. No. 371,466
Int. Cl.³ A01K *93/00*
U.S. Cl. 43—17 **10 Claims**



1. A fish detecting system for use with fishing tackle, comprising: signal sending and signal receiving means, said signal sending means including a spherical, bouyant housing containing a radio transmitter, a battery disposed in a lower portion of said housing and forming a source of power for said transmitter, a normally open switch disposed in a circuit between said battery and said transmitter, a plunger movable radially of said sphere between first and second positions in a path passing in proximity to said switch, said plunger including a magnet operable to move said switch to a closed position to actuate said transmitter when said magnet moves into proximity of said switch and to hold said plunger in a first position when said switch is in said normal position and fastening means including an attaching portion on said plunger to receive a fishing line forming part of said tackle, said signal receiving means including a radio receiver operable at a point remote from said signal sending means to receive a signal from said transmitter and activate an alarm upon movement of said plunger from said first towards a second position upon pull on said fishing line.

4,437,256

UNIVERSAL FLOAT LURE

Walter Kulak, 98 Oakdale Village, North Brunswick, N.J. 08902

Filed Apr. 30, 1981, Ser. No. 258,959
Int. Cl.³ A01K *85/01, 93/00*
U.S. Cl. 43—17.5 **12 Claims**

1. A float-lure kit comprising

a. an elongated main body section having at least two hollow areas therein and access means to said hollow areas from outside said main body section,

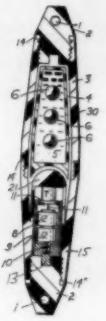
b. a self-contained lure cylinder insertable through one of said access means into one of said hollow areas, said cylinder comprising therein

i. oil,

ii. one or more metal balls and

iii. metallic reflecting particles,

said balls and said particles suspended in said oil, and



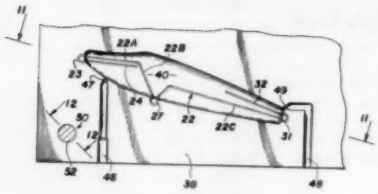
c. a light emitting diode containing cartridge insertable through one of said access means in one of said hollow areas.

4,437,257

FOAMED PLASTIC FISHING LURE BODY HAVING A CONTROLLED DENSITY AND A ONE-PIECE WIRE AND A METHOD FOR ITS MANUFACTURE

Douglas J. Kluge, 7979 Jonellen La., Golden Valley, Minn. 55427

Filed May 15, 1981, Ser. No. 263,897
Int. Cl.³ B29D *27/00*
U.S. Cl. 43—42.45 **13 Claims**

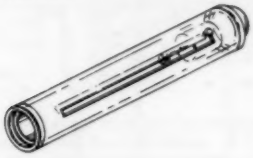


1. A method of making a foamed plastic fishing lure body having a controlled density and a one-piece wire located along the vertical central longitudinal plane of the body, with a mold assembly having a first plate and a second plate and groove means for accommodating portions of the wire adapted to be located in face-to-face relationship relative to each other, said first and second plates each having at least one cavity and groove means for accommodating portions of the wire, said cavities forming a body cavity having the outline shape of the lure body when the first and second plates are located in face-to-face relationship comprising: positioning the one-piece wire on the first plate by placing portions of the wire in the groove means of the first plate to locate the wire over the cavity in the first plate, closing the mold assembly by mounting the second plate on the first plate to locate the cavity of the second plate in registration with the cavity of the first plate and locate the wire in the groove means of the second plate thereby locating the wire along the vertical central longitudinal plane of the body cavity, holding the mold assembly in its closed position, introducing plastic materials into the body cavity, through a passageway in the mold assembly said plastic materials reacting to form a foamed plastic filling the body cavity and surrounding the wire extended through said body cavity, allowing gas to exhaust from the body cavity through vent means in the mold assembly during the reaction of the plastic materials and filling of the body cavity with foamed plastic, terminating the exhaust of gas from the body cavity and continuing the

reaction of the plastic materials to increase the density of the foamed plastic in the body cavity, opening the mold assembly by separating the first plate from the second plate, and removing the foamed plastic body and wire from the mold assembly.

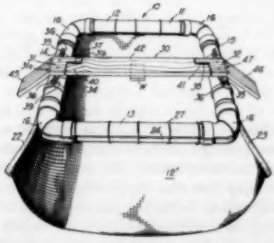
4. A fishing lure body made according to the method of claim 1, said lure body having a plastic body, said body having a nose and tail, a one-piece wire located along the vertical central plane of the body, said wire having a first loop projected from the nose, a second loop projected downwardly from a mid-section of the body, and a third loop projected from the tail.

4,437,258
FISHING LEADER HOLDER
Gilbert Allard, 11 McLean, Alymer, Quebec, Canada J9H 6A4
Filed Jan. 11, 1982, Ser. No. 338,735
Claims priority, application Canada, Nov. 18, 1981, 390330
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—57.1 **5 Claims**



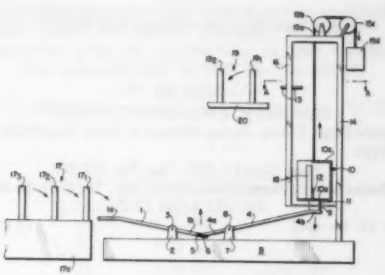
1. A fishing leader holder consisting of:
an outer cylindrical tube,
an inner cylindrical tube rotatable within the outer tube, and
a cylindrical securement part slidable within the inner tube, the inner and outer tubes having mutually alignable slots along their lengths, and the securement part having a radially disposed projection passing through both of the slots and means on the securement part for releasably securing fishing leaders such that when the securement part is slid into the inner tube the fishing leaders are retracted into the inner tube.

4,437,259
TURTLE TRAP AND PROCESS OF TRAPPING TURTLES
Hugh K. Holyoak, Rte. #1, Alapaha, Ga. 30130
Filed May 6, 1981, Ser. No. 261,014
Int. Cl.³ A01K *69/10*
U.S. Cl. 43—105 **3 Claims**



1. A turtle trap comprising: a cage having a porous submergible portion with an open top, means for supporting said cage with said porous portion submerged in water, a trip board disposed over said open top of said cage, means for moveably supporting said trip board for pivoting to release a turtle from said trip board through said open top and into said cage, said trip board being disposed in spaced relationship above the water level of the water in said cage, and a ramp disposed adjacent one end of said trip board and protruding at an incline into the water exteriorly of said cage for providing, with said trip board, a walkway for a turtle entering the trap; hinge means connected to opposite end portions of said trip board and platforms disposed over said means for supporting said cage, said hinge means being connected respectively to said platforms for permitting pivoting of said trip board.

4,437,260
DOMINO TOPPLING TOY
Takashi Yoshida, Tokyo, Japan, assignor to Yoshida Kogeisha, Tokyo, Japan
Filed Jun. 2, 1982, Ser. No. 384,394
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—1 R **5 Claims**



1. A domino toppling toy for toppling a plurality of domino pieces in domino trains located at different vertical elevations, comprising:
a carriage for transporting at least one intermediate domino piece and adapted to move up and down;
first means for applying an upward force to move said carriage upwardly;
second means for holding said carriage at a lower position against the upward force applied to the carriage by said first means;
third means for disabling said second means to hold said carriage at said lower position; and
fourth means for stopping the upward movement of said carriage after said third means disabled the operation of said second means, whereby said third means is actuated by the last domino piece in a lower domino train, and the first domino piece in an upper elevational domino train is toppled down in response to a toppling of said at least one intermediate domino piece which is caused by a shock exerted when said fourth means stops said upward movement.

4,437,261
YO-YO WITH TWIST-RESISTANT STRING
Patrick MacCarthy, 37 Mines Park, Golden, Colo. 80401
Continuation-in-part of Ser. No. 138,729, Apr. 9, 1980, Pat. No. 4,290,224. This application Aug. 18, 1981, Ser. No. 293,797
Int. Cl.³ A63H *1/30*
U.S. Cl. 46—61 **13 Claims**

1. A toy capable of combined rotational motion about a horizontal axis and translational motion in a vertical direction, comprising:
an axel;
a first disc connected at a center point to said axel;
a second disc connected at a center point to said axel;
a twist-resistant support connected at one end to said axel at a position between said first disc and said second disc;
wherein said support has a twist-resistance such that a length

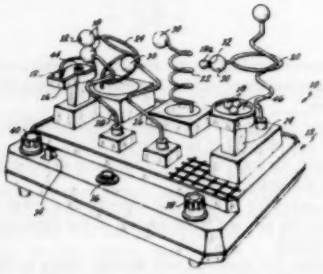
of said support of about 40 inches supporting a weight of about 30 grams will undergo no more than about 30 revolutions of twisting when subjected to a torque of 0.5 gram inch.

4,437,262

MAGNETIC AMUSEMENT DEVICE

Takashi Kaga, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan

Filed Mar. 17, 1982, Ser. No. 359,160
Claims priority, application Japan, Mar. 18, 1981, 56-38852
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—242 **12 Claims**



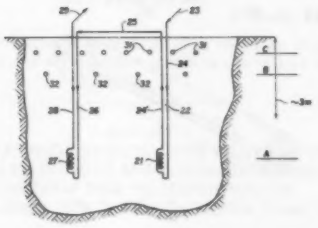
1. An amusement device which comprises:
a housing;
a first magnetic member movably mounted on said housing, said first magnetic member capable of moving in a first cyclic pathway with respect to said housing;
a second magnetic member movably mounted on said housing, said second magnetic member capable of moving in a second cyclic pathway with respect to said housing;
motor means associated with said first magnetic member and said second magnetic member for continuous moving said members in their respective said pathways;
each of said first and second cyclic pathways are circular pathways and are located adjacent to one another on said housing;
the orbital speed of said first magnetic member in its pathway being greater than the orbital speed of said second magnetic member in its pathway;
said first and said second magnetic members capable of being located in association with each other at a point of association of their respective pathways;
an object formed of a ferromagnetic material so as to be attracted to and temporarily magnetically attachable to each of said magnetic members;
said object capable of being temporarily magnetically attached to one of said first or said second magnetic members as said one of said first or said second magnetic members moves in its cyclic pathway and when said first and said second magnetic members are located at said point of association said object further capable of becoming detached from said one of said first or said second magnetic members and becoming magnetically attached to the other of said first or said second magnetic member.

4,437,263

SYSTEM FOR HEAT STORAGE PARTICULARLY FOR USING IN AGRICULTURE

Aharon Nir, Rehovot; Abraham J. Amiel, Moshav Ramot Meir, and Jonathan M. Krant, Ness Ziona, all of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Aug. 28, 1981, Ser. No. 297,363
Claims priority, application Israel, Sep. 4, 1980, 60969
Int. Cl.³ A01G *9/24, 13/06*
U.S. Cl. 47—1 R **13 Claims**



1. A system for use in agriculture for the underground storage of heat in soil and for the predetermined release of the stored heat in response to both daily and seasonal demands for the heat, comprising three stratified layers of fluid conduits located at shallow, intermediate and deepest depths below the surface of the soil, and means for circulating heated fluid through said conduits and between said conduits in said three layers.

4,437,264

HYDROPONIC APPARATUS AND METHOD

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

Filed May 25, 1982, Ser. No. 368,398
Int. Cl.³ A01B *79/00*; **A01G** *31/00*
U.S. Cl. 47—58 **4 Claims**

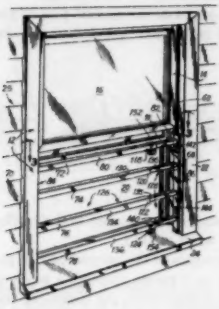
1. The method of supplying nutrient liquid to a plant growing system comprising a series of many planters that are essentially alike and that are disposed at a common level, the system including a supply line extending from a supply point to the planters in succession, including the steps of first supplying a first nutrient liquid to the supply line at the supply point under pressure so that the planters receive nutrient liquid to progressively lower levels in relation to their distances from the supply point due to attenuation of pressure along the supply line, interrupting the supply of liquid for equalizing the levels of liquid in the planters, thereafter supplying a second nutrient liquid different from the first at the supply point so that the planters receive such second nutrient liquid to progressively lower levels in relation to their distances from the supply point, and interrupting the supply of the second liquid for equalizing the levels of liquid in the planters, thereby to develop a range of different nutrient liquids in the successive planters.

4,437,265

SAFETY GUARD

Jerome Turro, 254 Spencer Pl., Riverdale, N.Y. 10471, and Peter Nelson, 2825 Schurz Ave., Bronx, N.Y. 10465

Filed Mar. 1, 1982, Ser. No. 353,283
Int. Cl.³ E06B 3/68
U.S. Cl. 49—57 1 Claim



1. A safety guard apparatus for installation into the frame of a window or the like, comprising:

first and second support elements, said elements having means for connecting said elements to said frame,

a plurality of bars having opposed ends, said ends being secured to said first and second support elements, said bars being disposed in spaced relationship and having means for adjusting said bars to a predetermined length, and

means for locking said bars to said predetermined length and preventing said length from being shortened, said means for unlocking including a means for unlocking, said means for locking being positioned on at least one of said bars,

whereby said means for locking maintains said plurality of bars at said predetermined length thus aiding in maintaining the integrity of the means for connecting said first and second support elements to said frame, said plurality of bars including

a first elongated member having one end secured to said first support element and having a receiving end, said first support element having an elongated central chamber open at said receiving end,

a second elongated member having one end joined to said second support element and having an opposed insertable end capable of being inserted into said chamber at said receiving end of said first member in sliding mating relationship, said second member being capable of being withdrawn from said first member,

whereby each of said bars may be adjusted to said predetermined length,

said first elongated member having a first cross-sectional area and said second elongated member having a second cross-sectional area, said first area being larger than said second area, said first member forming a shoulder with said first member at said receiving end, and

wherein said means for locking is mounted to said second member and positioned abutting said shoulder,

whereby said shoulder absorbs longitudinal pressure from said second member and said second member is prevented from passing farther into said chamber, and wherein said means for locking includes

a flexible sleeve portion mounted to said second member and positioned so as to abut said shoulder,

a flexible grip mounted around said sleeve portion, said grip having a longitudinal slot and two opposed flanges extending from said grip on either side of said slot, said flanges forming opposed bolt holes, one of said flanges forming a nut-gripping cavity around the bolt hole of said first flange, a nut capable of being held immobile in said cavity being positioned in said cavity, and a bolt having a threaded shaft, said shaft being positioned in said bolt holes and threaded to said nut, said bolt having a bolt head forming a keyway capable of receiving a key, said shaft being positioned in said bolt holes with said head positioned outside the flange opposite the flange holding said nut,

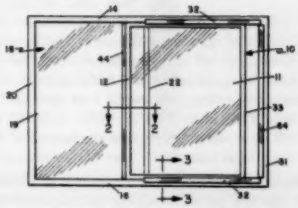
whereby when a key matching the keyway is inserted into the keyway and is turned in a bolt-tightening direction, the flanges of the grip are drawn together and the grip pressures the sleeve portion into pressured immobile relationship with said second member, and when the key is turned in an opposite direction, the sleeve portion is released.

4,437,266

WEATHERSTRIPPING KIT FOR SLIDING WINDOWS

Wilbur L. Keller, 9320 Idyl Pl., Lakeside, Calif. 92040

Continuation of Ser. No. 132,694, Mar. 21, 1980, abandoned.
This application Jan. 12, 1982, Ser. No. 338,859
Int. Cl.³ E06B 7/16
U.S. Cl. 49—493 14 Claims



1. A weatherstripping kit for sliding windows that are installed within opposing window channels defined by side channel walls, for movement parallel to an adjacent stationary panel, comprising:

a first elongated weatherstripping holder for attachment to a said side channel wall for holding weatherstripping in contact with said sliding window for providing a seal between said channel wall and said window over the width of said window when said window is closed; and

a second elongated weatherstripping holder for attachment to said sliding window at the end of the window adjacent the stationary panel for holding weatherstripping in contact with said stationary panel for providing a seal between said window and said panel over the length of said window;

wherein the first elongated holder includes a flat attachment surface running the length of the first holder for engagement with said side channel wall;

wherein the first elongated holder is shaped to define a T-slot running the length of the first holder for holding weatherstripping, facing in the same direction as the flat attachment surface and extending beyond the attachment surface in said same direction for holding said weatherstripping in contact with said sliding window when the attachment surface is attached to the outside of said side channel wall;

wherein the second elongated holder includes an attachment wall having an elongated flat attachment surface on the front holder for engagement with said adjacent end of said sliding window; and

wherein the second elongated holder includes an extension wall running the length of the second holder and inclined rearwardly at an acute angle from the attachment wall; and wherein the second elongated holder is shaped at the extended end of the extension wall to define a T-slot running the length of the second holder for holding weatherstripping and facing in a direction that is ninety de-

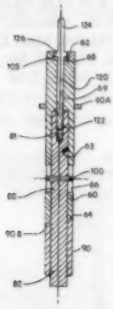
grees from the direction faced by the attachment surface for holding said weatherstripping in contact with said stationary panel when the attachment surface is attached to the end surface of said adjacent end of said sliding window.

4,437,267

SINGLE PASS SIZING TOOL AND MACHINE INCLUDING WEAR COMPENSATION MEANS

William G. Corley, Dearborn Heights, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Feb. 24, 1982, Ser. No. 351,685
Int. Cl.³ B24B *33/00*
U.S. Cl. 51—34 R **8 Claims**



1. A single pass abrasive tool attachable to a hollow machine spindle means and useful for sizing a workpiece bore to a given diameter comprising:

a hollow tool body having a first open end adapted for insertion inside said machine spindle means and a second open end facing the workpiece bore, an arbor member slidable axially in the tool body and having a threaded end adjacent the first open end of said tool body and a tapered end adjacent said second end, abrading means carried by at least one of said tool body and arbor member having a fixed single pass cutting diameter selected to produce said given diameter during a single pass axial and rotary movement through the bore, said abrading means being radially movable with respect to the tool body in response to axial movement of the arbor member for wear compensation purposes, and a wear compensation shaft rotatable in said tool body, said shaft having a first threaded end extending into the first open end of said tool body into threaded engagement with said threaded arbor end inside said tool body and having a second driven end extending out of said first open end inside said machine spindle means for rotation therein by shaft drive means, whereby axial sliding movement can be imparted to said arbor member by rotating said wear compensation shaft to reset a worn diameter of said abrading means to the original single pass cutting diameter.

4,437,268

BEVELING APPARATUS

Gaetano Righetti, Pesaro, Italy, assignor to Hoyne Industries, Inc., Rolling Meadows, Ill.

Division of Ser. No. 167,207, Jul. 9, 1980, Pat. No. 4,375,141.
This application Sep. 29, 1982, Ser. No. 428,108
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—327 **4 Claims**

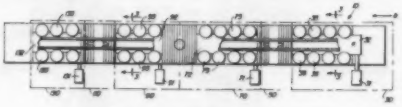
1. A method for grinding the edges of a workpiece having at least two pairs of parallel sides comprising:

conveying the workpiece through a series of sequential work stations;

grinding the edges of a first pair of parallel sides of the workpiece positioned parallel to the direction in which the workpiece is transported as the workpiece is conveyed through a work station;

lifting the workpiece from the means for conveying, rotating the workpiece to a position a second pair of parallel sides in a direction parallel to the direction in which the workpiece is transported, and lowering the workpiece back down to the means for conveying;

grinding the edges of the second pair of parallel sides of the workpiece positioned parallel to the direction in which



the workpiece is transported as the workpiece is conveyed through a work station;

polishing the edges of the second pair of parallel sides of the workpiece as it passes through a work station;

lifting the workpiece from the means for conveying, rotating the workpiece to position the first pair of parallel sides in a direction parallel to the direction in which the workpiece is transported, and lowering the workpiece back down to the means for conveying; and

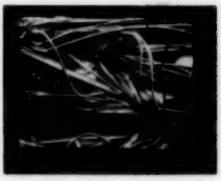
polishing the edges of the first pair of parallel sides of the workpiece as it passes through a work station.

4,437,269

ABRASIVE AND POLISHING SHEETS

George Shaw, Saffron Walden, England, assignor to S.I.A.C.O. Limited, Saffron Walden, England

Filed Aug. 5, 1980, Ser. No. 175,586
Claims priority, application United Kingdom, Aug. 17, 1979, 7928717; Jun. 16, 1980, 8018597
Int. Cl.³ B24D *11/02*
U.S. Cl. 51—358 **15 Claims**



8. An abrasive system including a pad adapted to be connected to a sanding tool, and an abrasive sheet arranged to be removably secured to the pad; the abrasive sheet comprising a backing layer carrying an abrasive on one side thereof with a textile material being adhered to an opposite side thereof, said textile material being made from woven or knitted yarn having filament loops or curls extending from its surface remote from the backing layer; and the pad having a woven fabric base layer which retains rows of spaced loop-engaging or curl-engaging members in the form of monofilament stalks having unhooked ends which extend in different inclined directions from the base layer for releasable securing engagement with the loops or curls of the textile material.

4,437,270
ABRADING TOOL

Warren L. Langstraat, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 123,448, Feb. 21, 1980, abandoned, which is a continuation of Ser. No. 914,197, Jun. 12, 1978, abandoned. This application Jun. 21, 1982, Ser. No. 390,748
Int. Cl.³ B24B 17/00
U.S. Cl. 51—364 5 Claims

1. In combination, a length of finishing material coated with pressure-sensitive adhesive and having opposite terminal end portions, and an abrading tool, said tool comprising:

a wheel of a firm material having an axis, a rim having a cylindrical outer surface, surfaces fixed relative to said wheel defining an axially extending slot transverse of and opening through said rim, said slot including inner and outer portions with said inner portion being narrower than said outer portion and being defined by parallel opposed surfaces fixed relative to said wheel and spaced to closely receive one of said terminal end portions of said length of finishing material therebetween while affording movement of said terminal end portion into and out of said inner portion, said wheel including means adapted for engagement by a drive assembly to rotate said wheel about said axis in a first direction; and

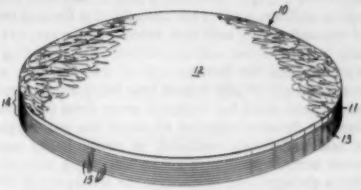
a support strip of elastic, resilient cellular material having a thickness of over 0.3 centimeter, a compression-deflection reading of up to 90 kilopascals, first and second ends, a leading end portion including said first end, a major portion including said second end, a skin layer having a contact surface with a surface pattern adapted for releasable engagement with the pressure-sensitive adhesive on said length of finishing material, and a surface opposite said contact surface fixed to said wheel with said major portion extending around said cylindrical surface, said second end adjacent said slot, and said leading end portion in the outer portion of said slot; the contact surface on said leading end portion being disposed at an obtuse angle with respect to the adjacent contact surface on said major portion, being disposed at an angle with respect to a radius of said wheel of between 10 to 35 degrees, and being spaced from the adjacent surface of said wheel defining the outer portion of said slot to provide clearance for the end portion of a said length of finishing material;

said length of finishing material being adhered to said contact surface by said pressure-sensitive adhesive with one of said terminal end portions projecting into the inner portion of said slot, said inner portion of said slot being disposed at a greater angle with respect to the radius of the wheel than the contact surface on the leading end portion of said strip to direct and press the adhesive coating on the strip of finishing material into firm engagement with the contact surface on said leading end portion of said support strip, and adhesion of the pressure-sensitive adhesive on said finishing material to said contact surface and one of said opposed surfaces defining the inner portion of said slot providing the only means for attaching said length of finishing material to said tool.

4,437,271
SURFACE TREATING PAD HAVING A RENEWABLE SURFACE

Thomas R. McAvoy, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 14, 1979, Ser. No. 20,314
Int. Cl.³ B24D 11/00
U.S. Cl. 51—400 6 Claims



1. A layered surface treating pad having a plurality of renewable working surfaces comprising in combination:

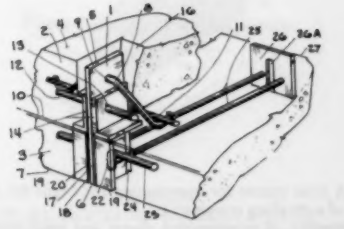
(1) a base layer which is about 3 mm to about 13 mm thick and which has a top substantially flat face and a bottom substantially flat face; and

(2) a stack comprising a plurality of thin layers of lofty nonwoven abrasive material adhesively removably fastened to said bottom substantially flat face, each layer of said stack having a thickness in the range of about 0.5 mm to about 20 mm, said layers being adhesively removably fastened to each other in said stack such that a force required to delaminate said layers in use is on the order of 9 to 450 grams per 25 mm width, said base layer and said stack providing a unitary layered pad which is capable of maintaining such unity during use and which permits each thin layer to be easily separated therefrom to expose a fresh treating surface of the next layer, when desired, without damage to the remainder of the pad.

4,437,272
INSERT FOR FOLDABLE CONCRETE BUILDING CONSTRUCTION WITH PIVOT CONNECTIONS, INTEGRAL LIFTING BAR, AND BUILDING HEIGHT CONTROL BAR

Delp W. Johnson, 240 Oakview Dr., San Carlos, Calif. 94070

Filed Jan. 28, 1982, Ser. No. 343,438
Int. Cl.³ E04B 1/344, 1/35; E04G 21/14
U.S. Cl. 52—64 9 Claims



1. An insert device for hingeably connecting an overlying ceiling slab to an underlying wall slab in folding slab constructed buildings, which device, simultaneously with a lifting operation, articulates a supporting anchor located at the top edge of said wall, into position to receive a bearing anchor in said ceiling slab, and the portion of said device within the thickness of said ceiling slab, transfers the vertical loads from upper modules to lower modules in said building, said device comprising:

a flat bar extending vertically through said overlying ceiling slab, down into a clearance notch in the hinged edge of said underlying wall slab, said flat bar positioned perpendicular to and adjacent to said hinged edge; and in addition, a shaped bar extending through the upper portion of said flat bar, said shaped bar extending horizontally thru said flat bar, and thence downward from sides of said flat bar to a location near the lower surface of said overlying slab; and said shaped bar there terminating in a hook, and said hook engages reinforcing bars in said overlying slab; and in addition, a pivot bar embedded at the mid thickness of said underlying wall slab, extends thru a vertical slotted hole in said flat bar, and said slotted hole extending downward toward the bottom end of said flat bar, and the overall length of said slotted hole being at least enough to permit said pivot bar to move away from said overlying slab, the distance required to permit the said hinged edge of said underlying wall slab to rotate freely under the lower surface of said overlying slab when said overlying slab is elevated; and in addition, an access notch is formed in upper portion of said overlying slab, adjacent to said flat bar, and said access notch is of such size and position to provide access to attach a lifting connection to said shaped bar adjacent to said flat bar; and in addition, at least one support anchor within said underlying wall slab, said support anchor engaging said pivot bar with a slip fit hole, and said support anchor positioned flat against the side of said flat bar, and one edge of said support anchor being coplanar with the said hinged edge of said underlying wall slab; and said support anchor is secured to at least one reinforcing bar in said underlying wall slab; and in addition at least one bearing anchor within said overlying ceiling slab, said bearing anchor positioned flat against the side of said flat bar, and said bearing anchor being secured to said flat bar by at least one bar extending thru said flat bar and said bearing anchor; and one edge of said bearing anchor being coplanar with the lower surface of said overlying slab, and in an erected position, said bearing anchor resting on said support anchor.

4,437,273

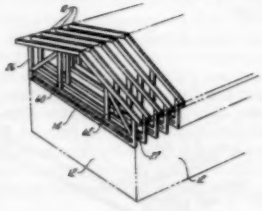
TRUSS CONSTRUCTION

Robert Helfman, Brighton, Mich. 48116

Continuation-in-part of Ser. No. 254,535, Apr. 15, 1981. This application Jun. 29, 1981, Ser. No. 278,726

Int. Cl.³ E04B 7/02

U.S. Cl. 52—93 **4 Claims**



1. A truss system for constructing the frame for an upper level of a dwelling comprising:

a plurality of preassembled planar and rigid trusses, said trusses being spaced apart and lying in substantially parallel planes,

at least two adjacent trusses of said plurality of trusses being substantially identical to each other, said at least two adjacent trusses each comprising:

an elongated floor joist, said joist comprising a pair of elongated spaced and parallel floor studs and a plurality of cross braces extending between and secured to said floor studs,

a pair of elongated outer wall framing members, each outer wall framing member secured at one end to opposite ends of the floor framing members so that said outer wall framing members are spaced apart and parallel to each other, each outer wall framing member having a length equal to substantially one half of the height of a convential living space,

a peaked roof support extending between and secured to the other ends of the outer wall framing members

a horizontally extending ceiling stud secured to said roof support at a position intermediate the ends of the roof support and so that said ceiling stud is spaced upwardly from the floor joist by an amount equal to the height of a conventional living space, said ceiling stud forming a frame for a subsequent horizontal extending ceiling wall partition, and

a first and second vertically extending inner wall studs, said inner wall studs having one end secured to said floor joist and their other ends secured to said roof support at a position spaced inwardly from one outer wall framing member so that said other end of said first inner wall stud intersects said roof support at a position closely adjacent to one end of said ceiling stud and so that said other end of said second inner wall stud intersects said roof support at a position closely adjacent to the other end of said ceiling stud, said inner wall studs forming a frame for subsequent vertically extending wall partitions, said inner wall studs, said ceiling stud and said floor joists together forming a substantially rectangular area having a height equal to the height of a conventional living space.

4,437,274

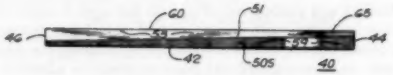
BUILDING PANEL

Donald H. Slocum, Villa Park; Albert W. Schairbaum, St. Charles, and William M. Curtis, Genoa, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed May 3, 1982, Ser. No. 374,166

Int. Cl.³ E04D 1/00

U.S. Cl. 52—105 **11 Claims**



1. A unitary building panel formed of composite wood fibrous material having generally parallel, inner and outer faces outlined by opposite ends and by upper and lower edges, said opposite ends of said panel adapted to closely face the end of an adjacent panel in the same course, said outer face having a large lower portion adapted for exposure to the weather with a substantially greater surface area than a narrow upper surface portion having a relatively smaller, substantially planar, surface area adapted to underlie a generally planar lower portion of the inner face of one or more of said panels laid up in a next higher course, said lower surface area of said outer face being deeply embossed to resemble a plurality of shingle-like elements laid up in a common course with each of said shingle like elements separated from an adjacent element by a groove tapered from a shallow depth adjacent an upper end adjacent said narrow upper surface portion toward a maximum depth opening into said lower edge of said panel, one of said opposite ends having a laterally outwardly projecting integral spacer adjacent an end of said smaller narrow upper surface portion extending laterally outwardly from said one of said opposite ends to provide an expansion space of a width generally similar to the width of said grooves between a lower portion of said one end and an adjacent end of an adjacent panel positioned in the same course.

4,437,275

COLLAPSIBLE SELF-SUPPORTING STRUCTURES

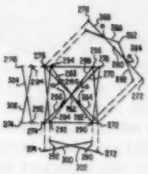
Theodore R. Zeigler, Oxon Hill, Md., assignor to Nomadic Structures, Inc., Alexandria, Va.

Division of Ser. No. 45,246, Jun. 4, 1979, Pat. No. 4,290,244, which is a continuation of Ser. No. 919,131, Jun. 26, 1978, abandoned, which is a continuation of Ser. No. 763,701, Jan. 28, 1977, abandoned, which is a division of Ser. No. 704,811, Jul. 13, 1976, Pat. No. 4,026,313. This application Aug. 7, 1981, Ser. No. 291,067

The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.

Int. Cl.³ E04H *12/18*

U.S. Cl. 52—109 18 Claims



1. A plurality of assemblies of crossed rod elements for forming a self-supporting structure, said assembly comprising, in combination:

a first series of at least three rod elements pivotally connected at their inner ends to define a central inner apical point and lying substantially in a common plane;

a second series of at least three rod elements pivotally interconnected at their inner ends to define a central outer apical point which is in spaced registry with said central inner apical point;

the outer ends of said first series of rod elements defining further outer apical points and the outer ends of said second series of rod elements defining further inner apical points, said further outer apical points defining the corners of a polygon having a pair of opposite, parallel sides; and

said first and second series of rod elements being disposed in crossed relations such that the two inner further apical points on each one of said pair of opposite, parallel sides are more closely spaced than the corresponding outer further apical points but with the inner further apical points on the remaining sides being spaced the same as the corresponding outer further apical points arranged in interconnected relation with alternate rows of said central outer apical points lying on the same side of the structure while the remainder of the rows of the central outer apical points lie on the opposite side of the structure, and with said opposite, parallel sides in parallel relation whereby to define a flat structure.

4,437,276

METHOD AND DEVICE FOR THE PERFORMANCE OF A SUPPORTING FUNCTION IN A PASSAGE

Jurgen Goldberg, Mittelweg 15, D-7801 Umkirch, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 307,082

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037177

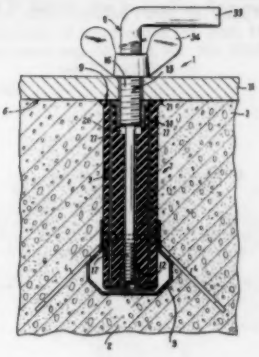
Int. Cl.³ E04B *1/41*

U.S. Cl. 52—125.5 49 Claims

1. A device for peforming a supporting function in a passage having an open end of predetermined cross-sectional area comprising:

(a) a plug which is expandable to said predetermined cross-sectional area and contractible to a lesser cross-sectional area, said plug having an outer end which is adapted to be located in the region of the open end of the passage and an inner end which is adapted to be located internally of the passage;

(b) an adjusting member for adjusting the cross-sectional area of said plug, said adjusting member engaging said plug in the regions of said outer and inner ends and being operative to lengthen and shorten said plug in axial direction thereof to thereby respectively reduce and increase the cross-sectional area of said plug, and said adjusting member having threaded portions in the regions of said outer and inner ends; and



(c) threaded sleeves arranged in the regions of said outer and inner ends and receiving respective ones of said threaded portions, said threaded portions and threaded sleeves being designed in such a manner that a predetermined rotation of said adjusting member causes said threaded portions to advance by different amounts, and the respective sets of threaded portions and threaded sleeves having different thread diameters.

4,437,277

Patent Not Issued For This Number

4,437,278

WALL PARTITION LOCKING SYSTEM

Donald K. Thomas, Jr., 1710 Laurel St., Pasadena, Calif. 91030

Filed Feb. 22, 1982, Ser. No. 350,821

Int. Cl.³ B21B *31/08;* B21C *1/04, 1/12*

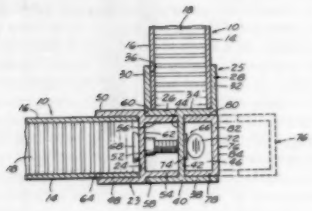
U.S. Cl. 52—239 7 Claims

1. A locking system for uniting two modular wall partitions normal to each other wherein each partition includes vertical end portions two spaced panels each respectively forming outer and inner wall surfaces, spacer means to maintain said panels in spaced relationship, said locking system comprising:

an elongated first frame member generally H shaped in

cross-section having a coplaner wall partition receiving inner and outer channel formed by a pair of spaced parallel legs, said channels divided by a cross member extending between said legs and said legs of said outer channel extending around one of said end portions and engaging the outer and inner wall surfaces of a first wall partition;

an elongated second frame member which includes a generally U shaped portion in cross section forming a wall partition receiving channel for a second wall partition normal to said first wall partition, said U shaped portion formed by a pair of spaced parallel legs and including a base member, and said legs of said outer channel extending around one of said end portions and engaging the outer and inner wall surfaces of said second of said partitions,



said second frame member also includes a generally T shaped portion in cross section projecting from said base member forming a coplaner inner and outer channel between said base member and the top of said T with the plane of said channels running normal to the plane of said wall receiving channel of U shaped portion;

a portion of said elongated first frame member adapted to frictionally interfit within a portion of second frame member; and

removable locking means including a portion in said first elongated frame member and a portion in said second elongated frame member which when united will draw said frame member toward each other and maintain the first and second partitions in interlocked relationship one normal to the other.

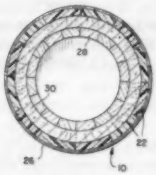
4,437,279

THERMALLY INSULATED TANK STRUCTURE AND METHOD FOR FORMING THE SAME

John E. Macaleese, Watertown, N.Y., assignor to Stebbins Engineering and Manufacturing Co., Watertown, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,246
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—247 **17 Claims**

16. A thermally insulated tank structure secured to a foundation comprising a tank sidewall secured to the foundation and defining an enclosed tank chamber, said tank sidewall including an outer layer formed from superimposed courses of elongated planks of urethane thermal insulating material, said courses of planks being joined together by adhesive and vertically disposed pins which extend into the planks in adjacent courses, the course of planks in contact with said foundation being joined end to end by adhesive and horizontally disposed pins extending into the ends of adjacent planks, the outer surface of said outer layer being coated with a layer of hard,



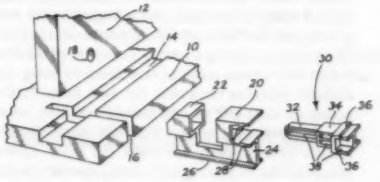
waterproof material formed of fiber filled mortar, an inner layer extending in substantially parallel spaced relationship to said outer layer, said inner layer being formed from blocks of refractory material, said refractory material being formed by ceramic tile joined by mortar joints, and a reinforced concrete core completely filling the space between said inner and outer layers and being adhered thereto.

4,437,280

CABINET PANEL CONNECTOR

David L. Collier, 255 NW. 96th Ave., Portland, Oreg. 97229

Filed Aug. 27, 1981, Ser. No. 296,891
Int. Cl.³ E04B *7/00*
U.S. Cl. 52—285 **11 Claims**



1. In combination with a pair of panels to be connected together, one panel provided with a mounting slot extending inwardly from one side edge thereof and the second panel provided with a locking bore, a panel connector comprising:

(a) a body member,

(b) a base member connected integrally to and projecting from said body member, the base member configured to slidably enter said mounting slot from said one side edge, with the body member projecting from the surface of said one panel facing said second panel, the base member also configured to engage said one panel to secure the base member and body member against movement in the direction of the surface of said one panel facing said second panel,

(c) a locking pin associated with said body member arranged to intercept said bore in the second panel and thereby lockably interconnect said second panel and the body member secured to said one panel, and

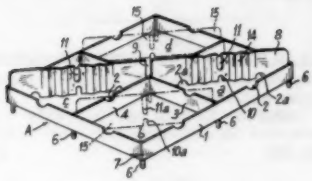
(d) second panel support means on the one panel arranged to engage the side of the second panel opposite said body member to prevent movement of the second panel away from the body member and disengagement from the locking pin.

4,437,281

WALL CONSTRUCTION PREFABRICATED FROM SELF-CONNECTABLE ELEMENTS

Jacques L. A. See, Neuilly-sur-Seine, and Sylvain V. L. Chevanne, Themericourt, both of France, assignors to Honeycomb Panels Patents Association Inc., Malibu, Calif.

Filed Feb. 2, 1982, Ser. No. 345,136
Claims priority, application France, Feb. 3, 1981, 81 02036
Int. Cl.³ E04C *1/00*
U.S. Cl. 52—309.1 **9 Claims**



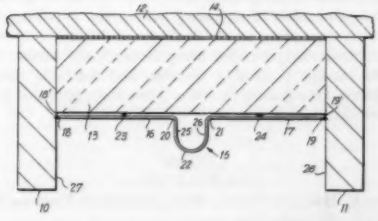
1. A wall construction prefabricated from self-connectable elements divided each into four compartments by cross-pieces and each comprising ribs forming diagonals, characterized by first and second hollow elements, the first hollow element comprising a square frame forming also cross-pieces and diagonal ribs, said hollow element having on one side protruding fingers for cooperating with a facing plate formed with holes corresponding to the protruding fingers, the diagonal ribs protruding on other side of the frame and being each formed with a least one notch complementary to that of the similar diagonal ribs carried by the second element, the second element being made in the same manner as the first element but closed on its side opposite to that from which protrude the diagonal ribs so that said second element forms a facing surface.

4,437,282

INSULATION SUPPORT HANGER

Michael B. O'Brien, 23 Shelburne Rd., Yonkers, N.Y. 10710

Filed Jun. 7, 1982, Ser. No. 386,190
Int. Cl.³ E04B *2/00*
U.S. Cl. 52—407 **2 Claims**



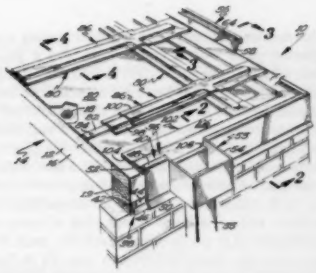
1. An insulation hanger device adapted to be applied by one-handed operation of an installer into mounted position between opposed parallel wooden surfaces, such as the surfaces of adjacent studs or joists, comprising an integral length of resilient metallic bar stock material, said material being bent to define a central bight or loop portion defining an expansion member generally U-shaped in plan and including spaced, generally parallel legs, the spacing between said legs being such as to permit the same to be squeezed toward each other by the hand of an installer, a linear rod member extending outwardly from the end of each said leg, said rod members being in co-axial alignment, the distal ends of said rod members defining sharpened points, the combination including retainer portions defined by metallic members affixed to said rod members in the area between said legs and points, said retainer portion metallic members being disposed perpendicular to the plane of said bight, the spacing of said distal end portions being variably responsive to compression and release to an expanded condition of said central expansion member.

4,437,283

SINGLE-PLY ROOFING SYSTEM

Louis J. Benoit, 1893 Highland Pkwy., St. Paul, Minn. 55116

Continuation-in-part of Ser. No. 358,175, Mar. 15, 1982. This application Sep. 30, 1982, Ser. No. 432,033
Int. Cl.³ E04B *5/00*
U.S. Cl. 52—410 **12 Claims**



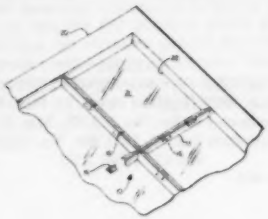
1. Roofing system sealing member for use in a roofing system having a roof covering sheet formed of a material and having a length and a width, comprising, in combination: a covering member formed from a material, with the material being sufficiently flexible to allow its application over irregular shapes and being able to withstand the expansion and contraction of the roof, with the covering member having a longitudinal length dimension and a first edge and a second edge defining a lateral width dimension therebetween, with the lateral width dimension being substantially less than the width of the roof covering sheet; a tape having sufficient flexibility to allow its application over irregular shapes and able to withstand the expansion and contraction of the roof and the roof sheet, with the tape having a longitudinal length dimension and a first edge and a second edge defining a lateral width dimension therebetween, with the width of the tape being larger than the width of the covering member and being substantially less than the width of the roof covering sheet, and with the tape having a first surface adhered to the covering member with the first edge of the covering member being located laterally inwardly of the first edge of the tape forming a first sealing edge and with the second edge of the covering member being located laterally inwardly of the second edge of the tape forming a second sealing edge, and with the tape having a second, exposed surface for adherence to the roof sheet; with the tape being fabricated with the covering member as a composite unit off the job site allowing its efficient manufacture and installation; wherein when a first composite roofing system sealing member intersects with a second composite roofing system sealing member to form troughs, the first and second sealing edges formed by the tape which extend beyond the covering member and the covering member of the first sealing member adhere to the roof sheet adhering surface of the tape of the second sealing member to act as seam sealers in the troughs created at the intersection of the roofing system sealing members.

4,437,284

SNAP-ON FALSE MUNTIN SYSTEM

James T. Cribben, Mechanicsburg, and William J. Ichter, Camp Hill, both of Pa., assignors to Capitol Products Corporation, Mechanicsburg, Pa.

Filed Aug. 4, 1980, Ser. No. 175,127
Int. Cl.³ E06B 3/70
U.S. Cl. 52—456 8 Claims



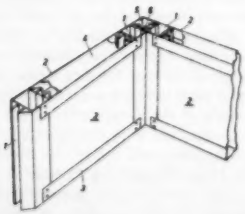
1. A false muntin assembly for a window having a peripheral sash, a glazing pane with a single light and a glazing bead holding said glazing pane in position in said sash comprising (a) an extruded false muntin bar having a central hole and channel extending into the hole from the back side of said bar and at its apex slightly narrower than the diameter of said central hole, said bar being shaped at its end to fit either the glazing bead or an intersection with another said bar, (b) a pin connector disposed in the central hole of the ends of said bar for connection of said bar with either the glazing bead or another said bar at an intersection, and (c) a metal clip having a head, two angularly spaced-apart legs projecting therefrom, each leg ending in a flange, said clip being adapted to snap-fit its head in the channel and central hole of said bar whereby said pin connector and clip can be snapped on in substantially the same manner so that when said clip is adhered to the glazing panel in proper alignment said false muntin assembly is releasably attached thereto and forms a multi-light effect.

4,437,285

BUILDING STRUCTURE

Inge Anderson, and Ronny Johansson, both of Pl. 3322 B, Åskloster, Sweden 430 21

This PCT application filed Apr. 27, 1981, Ser. No. 336,358
Claims priority, application Sweden, Apr. 29, 1980, 8003222
PCT No. PCT/SE 81/00127, § 371 Date Dec. 22, 1981, § 102(e) Date Dec. 22, 1981, PCT Pub. No. WO 81/03194, PCT Pub. Date Nov. 12, 1981
Int. Cl.³ A47F 5/00; E04B 2/60
U.S. Cl. 52—481 6 Claims



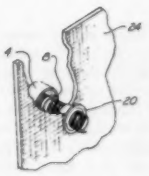
1. A building structure incorporating a framework of vertical posts, interconnected by base members and head members and with separate wall panels fitted in the spaces between the posts, base members and headmembers, comprising each post has an approximately H-shaped cross-section having legs and a web between the legs forming oppositely disposed grooves, the outer face of each leg is inclined inwardly, each base member and head member is provided with a groove facing towards the center of the framework, the grooves between the legs of the posts facing toward said center, the outer faces of the portions of the base and head members adjacent the grooves are inclined to extend parallel to said inclined faces of said posts, and said wall panels are thin walled panel sections having inturned flanges along all edges inclined to correspond with the respective inclined surfaces of the posts, base members and head members, said flanges at their outer edges being provided with folded back lip portions which engage with a snap-fit in the grooves of the respective posts, base members and head members.

4,437,286

MODULAR WALL PANEL FASTENER ASSEMBLY

Paul R. Maguire, Los Angeles, Calif., assignor to Pleion Corporation, Santa Ana, Calif.

Filed Feb. 22, 1982, Ser. No. 351,181
Int. Cl.³ E04B 1/38
U.S. Cl. 52—506 17 Claims



1. A modular wall panel fastener assembly for securing accessory items to a fibrous compressible panel member with a flexible cover comprising:

a mounting base having a cavity;

an open loop helical penetrating member secured at one end to, and extending from, the mounting base cavity to terminate in a relatively sharp tip for penetrating the flexible cover of the panel member with a minimum of damage, the loops of the helical member being embedded in the fibrous panel member; and

a grommet member having a base with an opening and a hollow tubular projecting member extending from the base to provide an opening extending through the grommet member, the projecting member is of a configuration that is capable of extending within the mounting base cavity depending on the thickness of the accessory item, the penetrating member being diametrically smaller than the tubular projecting member and rotatable relative therein for a guiding insertion through the grommet member opening into the panel member.

4,437,287

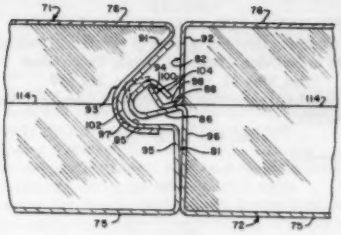
CEILING PANEL

Thomas C. Halfaker, Tupelo, Miss., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 25, 1982, Ser. No. 352,190
Int. Cl.³ E04B 1/82, 1/38, 1/74
U.S. Cl. 52—588 5 Claims

1. In a ceiling comprised of rectangular metal ceiling panels having a face panel and a back panel spaced from one another, the side and end margins of each said face and back panel being defined by the bend of a lip integral with said panel, the lips of said back and face panels being joined to form side and end walls connecting said face and back panels, the improvement comprising each end margin of said back panel's extending beyond the end margin of said face panel along the said end wall, the end lip of said back panel extending in a direction toward said face panel and the end lip of said face panel along said end margin being bent upwardly and then outboardly to

form a channel bottom, thence toward said face panel at an obtuse angle with respect to said channel bottom to define an



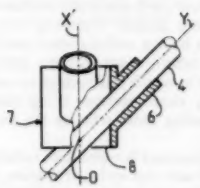
outboardly tending channel wall, thence toward said back panel to face-to-face engagement with said back panel end lip.

4,437,288

LATTICE-TYPE STRUCTURE, PARTICULARLY MAST SUPPORT OF ANTENNA

Yves Foissac, and Frederic N. B. Hung, both of Saint Amand les Eaux, France, assignors to Laboratoire d'Etudes et de Recherches Chimiques L.E.R.C., France

Filed Nov. 23, 1981, Ser. No. 323,674
Claims priority, application France, Dec. 1, 1980, 80 25454
Int. Cl.³ E04H *12/00*
U.S. Cl. 52—637 **7 Claims**



1. A lattice type structure, which comprises:

(a) a plurality of cylindrical, continuous uprights disposed in parallel like the parallel edges of a regular prism, and

(b) a plurality of rigid reinforcing panels connecting in two's said uprights,

(c) said panels comprising at least one pair of cylindrical sleeves having integral open socket means for holding reinforcing crosspieces, said sleeves having planar end faces with said uprights passing through said sleeves and said faces; the inner diameter of said sleeve being larger than the inner diameter of the socket means and the intersection of the axis of the socket means and the axis of said sleeve being at or near the intersection of one of said end faces with said sleeve axis, whereby reinforcing crosspieces may be inserted through said one end face, into said sleeve and thence into and through a said socket means; and reinforcing crosspieces engaged in said socket means for connecting said pair of sleeves together.

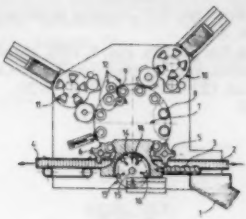
4,437,289

AUTOMATIC MACHINE FOR CAPPING AND LABELLING BOTTLES OR LIKE CONTAINERS

Jean Bedin, Bordeaux, France, assignor to Etablissements Larrieubedin "La Giroudine", Le Bouscat, France

Filed Nov. 2, 1981, Ser. No. 317,314
Claims priority, application France, Nov. 7, 1980, 80 23821
Int. Cl.³ B67B *5/00*; B65B *7/28, 61/00*
U.S. Cl. 53—64 **5 Claims**

1. Machine for automatically capping and labelling bottles or like containers comprising, a machine frame, labelling means mounted on the frame for applying labels to the bottle, capping means mounted on the frame for applying caps on the bottle, bottle support means mounted on the frame, bottle feeding means for feeding bottles successively onto said bottle support means and removing said bottles therefrom, means for conveying said bottle support means to a labelling position adjacent said labelling means and under said capping means, cap support



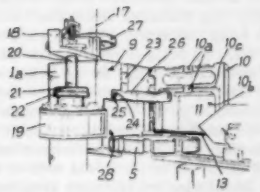
means mounted on said frame, cap feeding means for successively feeding said caps to said cap support means, cap orienting means mounted on said frame for orienting said cap support means having caps thereon with respect to a predetermined position, cap holding means mounted on said frame for engaging and holding a cap in the oriented position and conveying it to a bottle on said support means and depositing the cap onto said bottle, and power drive means for synchronously driving the above said means.

4,437,290

MACHINE FOR CRIMPING IN A CONTROLLED ATMOSPHERE

Jean-Charles Marchadour, La Feuillerais, Kerbascol, St Jean Trolimon, France (29120 Pont l'Abbe)

Filed Oct. 16, 1981, Ser. No. 312,304
Claims priority, application France, Oct. 17, 1980, 80 22241
Int. Cl.³ B65B *31/02*
U.S. Cl. 53—97 **4 Claims**



1. In a machine for crimping sub-assemblies in a controlled atmosphere, comprised of a frame forming support for a crimping head rotated about a vertical axis and for a device for supplying and evacuating the sub-assemblies to be assembled, moving in a plane substantially perpendicular to the said axis and partly beneath said head, said device and the frame cooperating to form an enclosure surrounding the crimping head and a source of vacuum or of neutral gas connected to said enclosure, the said enclosure being shaped at least for part in an element of the frame mobile with respect to the fixed remainder of the frame,

means for pivotally mounting said element on said frame about a lateral axis parallel to the axis of rotation of the crimping head forming a door to be closed in tight manner on a front surface of join arranged on said fixed frame, and

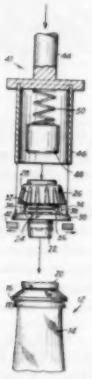
the said crimping head is mounted to rotate in a support, means for pivotally mounting said support to the frame to pivot out of the enclosure about a lateral axis parallel to

and transversely opposite the pivot axis of said door and on opposite side of said crimping head axis, said support comprising a bracket for supporting the crimping head for its positioning in or pivoting out of said enclosure.

4,437,291
METHOD AND APPARATUS FOR STOPPERING MODIFIED BOTTLES WITH A ONE-PIECE CORKING MEANS

Efim Zaltsman, Brooklyn, N.Y., assignor to Monarch Wine Co., Inc., Brooklyn, N.Y.

Division of Ser. No. 223,894, Jan. 9, 1981, abandoned. This application Apr. 16, 1982, Ser. No. 369,191
Int. Cl.³ B67B *1/04, 3/22, 7/20*
U.S. Cl. 53—319 **2 Claims**



1. An apparatus for stoppering a bottle having an elongated neck portion with a mouth and an annular flange thereon near the mouth, utilizing a molded one-piece elastomeric corking means having an elongated, generally circular cylindrical stopper, insertable with frictional engagement into the mouth of the bottle, a head connected to the stopper, an annular circumferential ring positioned and spaced below the head as molded and being concentric with the stopper, the internal diameter of said ring being slightly smaller than the external diameter of said annular flange on the bottle, a flexible elongated tether having one end connected to the ring and the other end connected to the head for joining said ring to said head, the tether being in a folded state as molded and having a length substantially greater than the distance between said one end and said other end in the folded state of the tether, the tether in its folded state not extending away from the axis of the stopper by a distance greater than the radius of the ring, the tether being long enough to permit the cork to be withdrawn from the mouth of the bottle while the tether is unfolded and while the ring is captive on the bottle and to move far enough away from said mouth to permit pouring of the liquid contents from the bottle, and at least one short frangible bridge connecting the folded tether to another element of the corking means, said stoppering apparatus comprising:

(a) means for holding the corking means in alignment and orientation above the mouth of an open bottle for stoppering of said bottle;

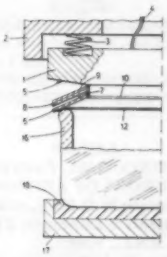
(b) means for driving the stopper into the mouth of the bottle and for lowering the ring toward but not over the flange on the bottle; and

(c) means for thereafter forcing the ring downwardly over the annular flange causing the ring first to expand as it passes over the flange and then to constrict after it has passed the flange and causing at least one frangible bridge to break, thereby releasing the tether to permit the stopper to move away from the mouth of the bottle except for the connection of one end of the tether to the head and the other end of the tether to the ring.

4,437,292
APPARATUS FOR SEALING CONTAINERS

Hermann Buri, and Beat Karth, both of Kirchberg, Switzerland, assignors to Nyffeler, Corti AG, Berne, Switzerland

Filed May 11, 1981, Ser. No. 262,699
Claims priority, application Fed. Rep. of Germany, May 23, 1980, 8014020[U]
Int. Cl.³ B67B *7/28*
U.S. Cl. 53—357 **7 Claims**



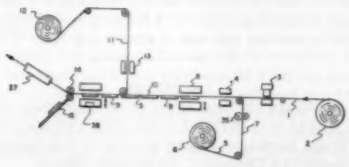
1. Apparatus for sealing a thin cover coated with thermoplastic material to a rim of a container, of the type comprising a heatable sealing head and a resiliently yielding pressing member together adapted for transmitting pressure and heat to said cover, said pressing member including two or more superposed cup springs having radially inner portions fixed to said sealing head and radially outer portions, said cup springs having a relaxed state in which said springs are conically disposed with said radially outer portions being spaced axially outwardly of said sealing head, wherein the improvement comprises:

a spacer piece disposed between said radially inner portions of the one of said cup springs remotest from said sealing head and of at least another one of said cup springs, said spacer piece having a smaller outside diameter than said one of said cup springs, whereby a clearance space is created between said cup springs.

4,437,293
METHOD AND APPARATUS FOR MAKING A RECLOSABLE PACKAGE

Philip A. Sanborn, Jr., Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation-in-part of Ser. No. 65,300, Aug. 9, 1979, Pat. No. 4,240,241. This application Nov. 6, 1980, Ser. No. 204,440
The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.
Int. Cl.³ B65B *31/02, 61/18*
U.S. Cl. 53—412 **2 Claims**



1. A method for making a reclosable package from thermoplastic materials comprising the steps of:

(a) providing a formable web, a covering web, and a closure strip;

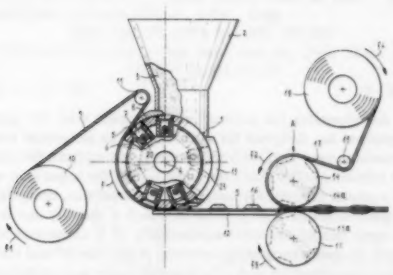
(b) forming a cavity with a peripheral flange in said forming web so that said closure strip remains on a portion of said peripheral flange;
(c) advancing the forming web and closure strip towards each other;
(d) sealing the lower surface of the closure strip to the forming web longitudinally in the direction of travel of the forming web;
(e) indenting a portion of said closure strip by the application of heat and pressure at intervals spaced apart by approximately the desired length of the package;
(f) placing a product in said cavity;
(g) covering said product with said covering web;
(h) evacuating the space between said webs;
(i) sealing the webs together with longitudinal and transverse seals, one longitudinal seal being adjacent and parallel to but spaced apart from the closure strip with the closure strip within the periphery of the seals, and the transverse seals being made across the closure strip where a portion of the strip had been indented; and
(j) sealing the upper surface of the closure strip to the covering web.

4,437,294

VOLUMETRIC BATCHING DEVICE FOR PROVIDING PREDETERMINED BATCHES OF A FLUENT MATERIAL

Andrea Romagnoli, San Lazzaro di Savena, Italy, assignor to I.M.A.-Industria Macchine Automatiche-S.p.A., Ozzano Emilia, Italy

Filed Apr. 8, 1981, Ser. No. 252,123
Claims priority, application Italy, Apr. 17, 1980, 3389 A/80
Int. Cl.³ B65B 9/02
U.S. Cl. 53—553 **2 Claims**



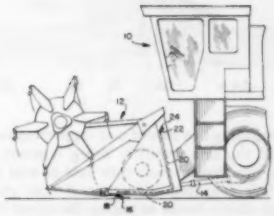
1. A volumetric batching device providing predetermined batches of a fluent material in a packaging machine, comprising: a cylindrical dispensing drum having a periphery and rotating about a horizontal axis, said drum having a plurality of radially outwardly open pockets and a plurality of radially movable pistons, each of said plurality of pistons being associated with and defining a respective one of said pockets; means for supplying the material to be dispensed into the pockets, said supplying means being arranged near said drum; a smoothing element positioned near a top dead center point of said drum; and means for guiding a filter paper strip around and in a direction of rotation of said drum from said smoothing element to a position at a bottom dead center point of said drum from which the predetermined batch of the material is forwarded to a packaging station; means for moving each piston between a first position of a maximum distance to the periphery of the drum in which first position the piston passes the top dead center point of said drum and is located below the supplying means for receiving the predetermined batch of the product and a second position of a minimum distance to the periphery of the drum in which second position the piston passes the bottom dead center point for discharging the predetermined batch of the material, each of said pistons having an inside hollow cylindrical space and an outer perforated portion facing the periphery of the drum and defining the respective pockets so as to provide ventilation of the pocket into the inner cylindrical space of each piston and thereby preventing adhering of the material to the outer portion of each piston.

4,437,295

AUTOMATIC HEADER HEIGHT CONTROL

Merlin A. Rock, Bettendorf, Iowa, assignor to International Harvester Co., Chicago, Ill.

Filed Apr. 8, 1981, Ser. No. 252,481
Int. Cl.³ A01D 75/28
U.S. Cl. 56—10.2 **24 Claims**



7. An automatic header height control apparatus for use with a header of a farm implement, the height of which header can be adjusted relative to the ground therebeneath, said apparatus comprising: means for continuously sensing the height of the header above ground; means for selecting a desired height of the header above ground; and multifunction electrical circuit means, coupled to said sensing means and said selecting means (a) for continuously determining any difference error between the selected height and the sensed height, (b) for determining the direction of the difference error, up or down, (c) for continuously generating a train of electrical correction pulses at a predetermined constant frequency, each electrical correction pulse of said train of pulses having a constant amplitude and a duty cycle directly related to the amount of difference error, (d) for supplying said electrical correction pulses to solenoid operated valving means to cause same to supply and/or relieve a pulse of pressurized fluid to a mechanism for raising or lowering the header for each electrical correction pulse received and (e) for repeatedly determining the difference error and direction of the difference error, and cyclically generating correction pulses and supplying said correction pulses to the solenoid operated valving means to move the header in intermittent pulses toward the selected height, thereby automatically to control the height of the header above ground.

4,437,296

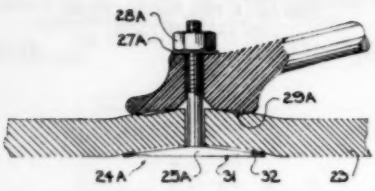
DRAPER PICK-UP TINE

Victor B. Erdman, Leathbridge, Canada, assignor to Victory Equipment Limited, Lethbridge, Canada

Continuation-in-part of Ser. No. 108,562, Dec. 31, 1979, abandoned. This application Jun. 9, 1981, Ser. No. 271,938
Int. Cl.³ A01D 77/00
U.S. Cl. 56—400 **8 Claims**

1. A pick-up tine assembly for use with drapers, pick-up belts or the like which constitutes a flexible supporting surface; comprising a supporting surface engaging base portion, a tine extending from said base portion and means on the underside of said base portion to prevent said tine assembly from inadvertent turning relative to the plane of said supporting surface, when attached thereto, said means including at least one edge sharpened rib extending across said underside of said base and projecting from the plane thereof, said base portion including a dome-shaped supporting surface engaging element, a tine

attaching block formed upon the upper side of said element, said tine extending upwardly and outwardly from one end of said block, clamping means detachably securing said assembly to the supporting surface in any radial position relative to the plane of said supporting surface whereby said tine extends and is maintained in any desired radial direction relative to the plane of said supporting surface, said clamping means including a screw threaded bolt, a relatively large head on said bolt having a flat outer surface and a domed inner surface, said bolt extending through said supporting surface, with the domed



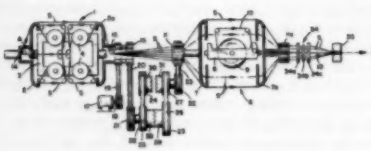
inner surface engaging one side of said supporting surface, said base portion of the tine assembly being concave, said tine assembly being situated on the other side of said supporting surface, said bolt engaging through said base portion, and screw threaded clamp means engaging the upper end of said bolt and clamping said tine assembly to said supporting surface and urging said supporting surface into said concave base whereby the flat outer surface of the bolt head is substantially flush with said one side of said supporting surface, and the said rib embeds within said supporting surface.

4,437,297

APPARATUS FOR PRODUCING METALLIC CORDS IN LAYERS

Alberto Vespasiani, Milan, Italy, assignor to Societa' Pneumatici Pirelli S.p.A., Milan, Italy

Filed Feb. 23, 1982, Ser. No. 351,367
Claims priority, application Italy, Feb. 26, 1981, 19994 A/81
Int. Cl.³ D07B *3/04, 3/12, 7/02*
U.S. Cl. 57—9 **10 Claims**



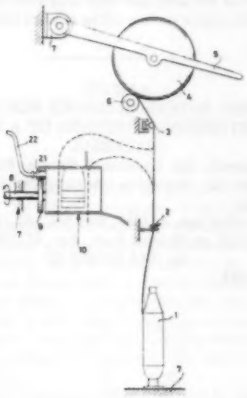
1. An apparatus for producing metallic cords for reinforcing elastomeric structures, comprising a central core and at least one crown layer, the wires of each crown layer being mutually helical and parallel and wound on the layer radially inwardly therefrom and on the central core, said apparatus comprising first and second double-twist type machines disposed in tandem, each of said machines consisting essentially of a cage rotatable around its own axis and of a cradle which is disposed in the cage and co-axial therewith, and freely rotatable around its own axis, the first cradle being adapted to support delivery bobbin or bobbins of a first group of wires for forming said crown layer, the second cradle being adapted to support delivery bobbin or bobbins of a second group of wires for forming a central core on which a crown layer of wires is to be wound, said apparatus comprising also a preforming device adapted to deform permanently be bending the wires of said first group and a device reciprocally coupling said first and second machine which is adapted to maintain during operation a constant ratio of 1:2 between the rotation velocities of the first and second cages, said apparatus being characterized by the fact that said coupling device allows variation of said ratio between the rotational velocity of the first and second cages from 1:1 during the transient starting to 1:2 during operation, guiding means being also provided on the second machine for the wires of said first group, disposed externally of the cage, on both its extremities, and fastened with the same and oriented coplanarly to the rotation axis of said second cage.

4,437,298

APPARATUS FOR JOINING TEXTILE THREADS WITH THE AID OF COMPRESSED AIR, FOR MOUNTING ON AN AUTOMATIC WINDING MACHINE

Ferdinando Truzzi, and Mauro Premi, both of Salo' , Italy, assignors to Mesdan S.p.A., Salo' , Italy

Filed Jun. 9, 1982, Ser. No. 386,681
Claims priority, application Italy, Jun. 11, 1981, 22268 A/81
Int. Cl.³ B65H *69/06;* D01H *15/00;* D02J *1/08*
U.S. Cl. 57—22 **12 Claims**



1. An apparatus for joining textile threads with the aid of compressed air, designed for mounting on an automatic winding machine provided with means for inserting both the yarns to be joined together from the same side of the apparatus, and with a power take-off for operating the apparatus, comprising a support structure with a block in which a laterally and frontally open mixing chamber substantially of V cross-section is formed, an aperture opening centrally at the base of said chamber and connected by way of a shut-off valve to a compressed air source, a cover carried by a support movably mounted in said structure so as to frontally close said chamber, means for controlling the movement of said cover from a rest position withdrawn from the chamber to a frontal closure position therefor, means synchronised with said cover movement control means for causing said shut-off valve to open for a predetermined time when the cover is in the position in which it closes the chamber, fixed guides for positioning the threads to be joined together, locking members for the threads constituted by fixed and mobile elements, members constituted by fixed and mobile blades for cutting the free ends of the threads, and means for controlling the mobile elements of the locking members and the mobile blades of the cutting members in synchronism with the movement of the cover, characterised in that said structure is provided with two opposing walls which are parallel to each other and to the longitudinal axis of the mixing chamber and disposed at a distance respectively in front of and behind the block comprising said chamber, the thread positioning guides being provided in said walls in aligned pairs to receive the threads to be joined together along parallel axes perpendicular to the axis of the chamber and passing to the side of this latter, the two guides provided in the wall disposed in front of the chamber being at different heights, on said wall

disposed in front of the chamber there being mounted rocking means for crossing-over the threads in the region between said wall and the mixing chamber, the mobile and fixed elements of the members for locking the threads and of the mobile levers for adjusting the length of the free ends of the threads being mounted on the wall disposed behind the block comprising the mixing chamber in positions corresponding to the positioning guides provided in this wall, on the same wall there being mounted a member for operating the shut-off valve, the cutting members being disposed at the two sides of the mixing chamber with the mobile blades rigid with the support for the chamber closure cover, in said structure there being mounted a control drum which is rotatable about its axis, can be coupled to said power take-off of the winding machine, and is provided with a plurality of cam profiles for controlling the movements of the members for crossing-over the threads, the mobile elements of the members for locking the threads, the mobile levers for adjusting the length of the free ends of the threads, the operating member for the shut-off valve and the cover with the mobile blades of the members for cutting the threads.

4,437,299

APPARATUS FOR JOINING TEXTILE THREADS WITH THE AID OF COMPRESSED AIR

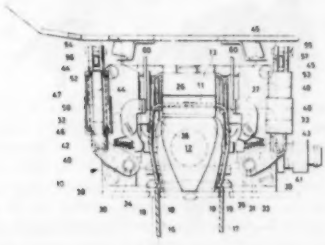
Ferdinando Truzzi, and Mauro Premi, both of Salo' , Italy, assignors to Mesdan S.p.A., Salo' , Italy

Filed Jun. 10, 1982, Ser. No. 387,147

Claims priority, application Italy, Jun. 16, 1981, 22356 A/81

Int. Cl.³ B65H *69/06*

U.S. Cl. 57—22 **8 Claims**



1. An apparatus for joining textile threads with the aid of compressed air, provided with a mixing chamber, means for feeding a burst of compressed air into said chamber for a predetermined time, and means which during the joining operation lock the threads to be joined at the points in which they enter the apparatus, characterised by incorporating a device for checking the tearing strength of the joint zone of the two threads comprising at least one mobile member arranged to act on the loop formed by the joined threads with a predetermined traction force at an intermediate point between the locking points at the apparatus inlet, control means for said mobile member which are operated so that they travel through a predetermined outward and return stroke, and a yieldable coupling disposed between said mobile member and said control means, said joint being set to yield when said predetermined traction force is exceeded.

4,437,300

DEVICE FOR THE CONTINUOUS SPINNING OF TEXTILE YARNS

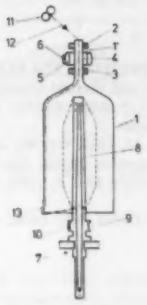
Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier-Geneve, Switzerland

Filed Nov. 24, 1981, Ser. No. 324,943

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1980, 3046180; Dec. 12, 1980, 3046932; Dec. 16, 1980, 3047275

Int. Cl.³ D01H *1/06, 1/20, 7/66*

U.S. Cl. 57—74 **10 Claims**



1. In a device for continuous spinning of textile yarn including a spindle, a member for providing twist in the yarn, said member defining a yarn guiding opening for guiding the yarn moving towards the spindle, means for mounting said member for rotation about the spindle axis independently of the spindle, spindle drive means for rotating the spindle, and drive means for rotating said member, the improvement comprising a freewheel arranged between said member and said drive means for rotating the member, for allowing the member to rotate more rapidly than the member drive means.

4,437,301

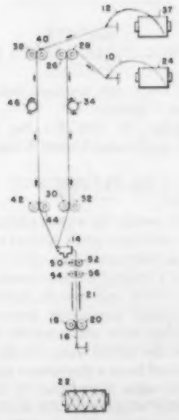
METHOD OF MAKING YARN

Paul W. Eschenbach, Moore, and Andre M. Golneau, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 25, 1982, Ser. No. 361,558

Int. Cl.³ D02G *3/00, 3/04*

U.S. Cl. 57—289 **3 Claims**



1. The method of producing an entangled, composite, multi-

filament synthetic yarn comprising the steps of: supplying a multifilament, partially oriented, synthetic core yarn and a multifilament, partially oriented, synthetic effect yarn, heating both the core and effect yarns, drawing the core yarn after heating, drawing the effect yarn after heating at a draw ratio greater than the draw ratio of the core yarn, supplying the drawn effect yarn directly without texturing to an air jet at a first rate, supplying the drawn core yarn directly without texturing to the air jet at a second rate, entangling the untextured core and effect yarns in the air jet and taking up the commingled yarn from the air jet.

4,437,302

FALSE TWISTING AIR NOZZLE

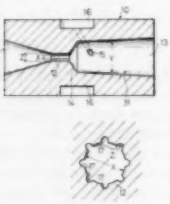
Meiji Anahara, Kariya, and Hiroshi Omori, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jan. 19, 1983, Ser. No. 459,131

Claims priority, application Japan, Jan. 20, 1982, 57-7269; Dec. 4, 1982, 57-183824[U]; Dec. 6, 1982, 57-184579[U]; Dec. 11, 1982, 57-217566

Int. Cl.³ D01H 7/92; D02G 1/04

U.S. Cl. 57—333 **21 Claims**



1. A false twisting air nozzle comprising:

a fiber bundle passage for allowing a fiber bundle to pass therethrough, said fiber bundle passage including an inlet, a smaller-diameter hole portion, and a larger-diameter hole portion which are arranged in series;

at least one air injection hole having end opening tangentially and downstream in said larger-diameter hole portion; and

at least one air passage disposed adjacent to said smaller-diameter hole portion and in communication with said larger-diameter portion.

4,437,303

FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Hugh F. Cantwell, Littleover, England, assignor to Rolls-Royce Limited, London, England

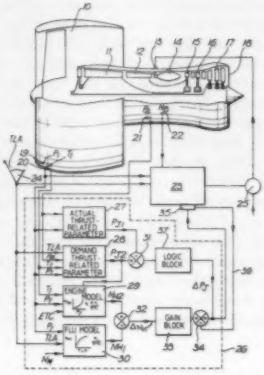
Filed Nov. 10, 1981, Ser. No. 320,126

Claims priority, application United Kingdom, Nov. 26, 1980, 8037966

Int. Cl.³ F02C 9/28

U.S. Cl. 60—39.281 **5 Claims**

1. A fuel control system for a gas turbine engine comprising transducers for producing signals related to parameters of the engine, including at least one thrust-related parameter, a throttle lever on which a desired engine thrust may be set, a main steady-state fuel control unit which determines a value of a first said thrust-related parameter corresponding with the setting of the throttle lever and controls the fuel flow to the engine to maintain the actual value of the first thrust-related parameter determined from a transducer signal at least approximately equal to the value determined by the fuel control unit, and a trimmer device which provides a more accurate control of engine thrust by trimming the fuel flow demanded by the main fuel control unit, the trimmer incorporating a model of said main fuel control unit in which the predicted value of said first thrust-related parameter determined by said main fuel control unit in accordance with the setting of the throttle lever



is calculated and used to produce a first trim setting during non-steady state operation of the engine.

4,437,304

STRUCTURE FOR CONTROLLING OPERATIONS OF SECONDARY AIR SUPPLY MEANS AND THROTTLE OPENER IN INTERNAL COMBUSTION ENGINE FOR MOTORCYCLES

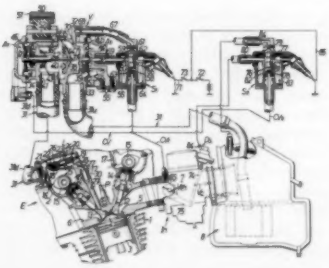
Yasuo Ikenoya, Kawagoe; Shuso Ueda, Asaka, and Masafumi Araki, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,334

Claims priority, application Japan, Dec. 24, 1981, 56-212713

Int. Cl.³ F01N 3/22

U.S. Cl. 60—290 **1 Claim**



1. A structure for controlling operations of a secondary air supplying means and a throttle opener in an internal combustion engine for motorcycles in which an internal combustion engine is mounted on a main frame and includes suction and exhaust systems, an exhaust gas cleaning means for supplying secondary air to said exhaust system so as to clean an exhaust gas flowing therethrough, a carburetor provided in said suction system and including a throttle valve, and a throttle opener provided on said carburetor and adapted to open said throttle valve slightly while said internal combustion engine is rotated at a low speed, said structure comprising a secondary air supply passage communicated with said exhaust system, a control valve adapted to control a flow rate of the secondary air flowing through said secondary air supply passage, a first electromagnetic valve for opening and closing said secondary air control valve, a second electromagnetic valve for controlling an operation of said throttle opener, a power source circuit

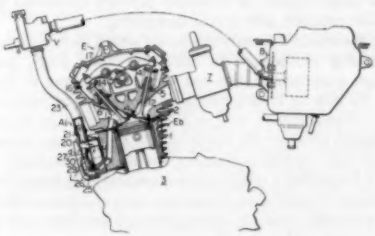
for connecting said first and second electromagnetic valves to a power source, and a switch used in common with said secondary air supply means and said throttle opener, provided in said power source circuit, and adapted to detect such a vehicle speed of said motorcycle that is not higher than a predetermined level and thereby shift the operations of said first and second electromagnetic valves, whereby said secondary air control valve is closed with the operation of said throttle opener rendered ineffective at the same time.

4,437,305

EXHAUST GAS CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yasuo Ikenoya; Masafumi Araki, both of Kawagoe, and Yozi Shimizu, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,330
Claims priority, application Japan, Dec. 17, 1981, 56-204302
Int. Cl.³ F01N *3/30*
U.S. Cl. 60—293 1 Claim



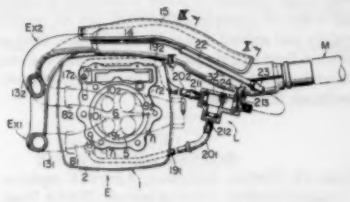
1. In an exhaust gas cleaning system for internal combustion engines which is provided with a secondary air feed system connected to an exhaust port of an internal combustion engine and a reed valve device mounted midway of the secondary air feed system and opened on an exhaust pulsation pressure arising in the exhaust port at the time of internal combustion engine operation to feed an exhaust gas cleaning secondary air to the exhaust port, the improvement characterized in that the secondary air feed system has an upstream side secondary air passage through to the atmosphere and a downstream side secondary air passage formed on a thick wall zone of the internal combustion engine proper and connected through to the exhaust port, the reed valve device has a valve casing installed on the circumference of the engine proper, an inflow port connected to the upstream side secondary air passage, and an efflux port connected to the downstream side secondary air passage, the valve casing is partitioned internally into an upstream chamber provided adjacently to the engine proper and connected through to the inflow port and a downstream chamber provided on a side away from the engine proper across the upstream chamber and connected through to the efflux port, a reed valve body to allow a secondary air to flow from the upstream chamber to the downstream chamber on an exhaust pulsation pressure in the exhaust port is arranged between both the upstream and downstream chambers.

4,437,306

EXHAUST GAS CLEANING DEVICE OF INTERNAL COMBUSTION ENGINE

Yasuo Ikenoya, Kawagoe; Kanau Iwashita, Sakato, and Hikaru Kimura, Koganei, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,793
Claims priority, application Japan, Nov. 25, 1981, 56-188555; Dec. 9, 1981, 56-197888
Int. Cl.³ F01N *3/30*
U.S. Cl. 60—293 6 Claims



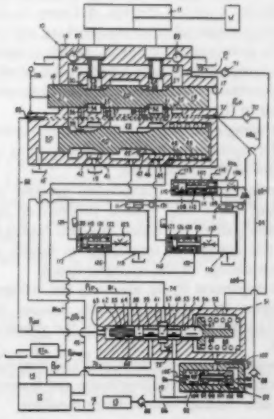
1. In an internal combustion engine having a plurality of exhaust systems which are made different in length from each other and comprise a plurality of exhaust ports formed in an engine main body and separately communicated with a combustion chamber above a single cylinder and exhaust pipes communicated with said plural exhaust ports respectively, an exhaust gas cleaning device wherein secondary-air supply pipes are communicated with said plural exhaust systems respectively and further connected with reed valve means adapted to open and close in response to the pulsation pressures of the exhaust gas in said plurality of exhaust systems communicated with said secondary-air supply pipes.

4,437,307

PRIORITY FLOW CONTROL SYSTEM

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Mar. 11, 1982, Ser. No. 357,035
Int. Cl.³ F15B *13/08*
U.S. Cl. 60—427 18 Claims



1. A priority flow control system supplied from a source of pressure fluid and connected to exhaust means said priority flow control system including a priority valve assembly opera-

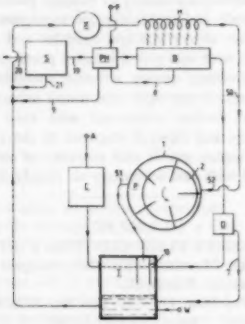
ble to control a load and at least one other valve assembly said other valve assembly having a housing connected to a fluid motor, control orifice means in said housing interposed between said source of pressure fluid and said fluid motor, fluid flow control means in said housing, first control means operable through said fluid flow control means to maintain a pressure differential across said control orifice means at a controlled constant level, and second control means having first means responsive to maximum fluid flow from said source of pressure fluid and second means operable through said fluid flow control means and said first control means to vary the level of said constant pressure differential whereby the level of said constant pressure differential can be progressively lowered by said second means once fluid flow from said source of pressure fluid will approach its maximum flow output and flow demand of said priority flow control system will exceed said maximum flow output.

4,437,308

ROTARY HEAT ENGINE

Victor H. Fischer, Artarmon, Australia, assignor to Thermal Systems Limited, Cayman Islands, British West Indies

Filed Dec. 12, 1980, Ser. No. 215,824
Claims priority, application Australia, Aug. 18, 1980, PE5095
Int. Cl.³ F01K *7/36*
U.S. Cl. 60—514 **29 Claims**



1. A method of operating a rotary external combustion engine having a stator therein defining a working space, wherein energy is supplied to the working space by means of a vaporizable heat-transfer medium, which comprises

(1) in a compression cycle wherein the working space volume decreases, compressing gaseous heat-transfer medium present in the working space;

(2) generating externally of the working space heated heat-transfer medium under a pressure such as to maintain the medium in the liquid state;

(3) injecting into the compressed gaseous medium in the working space said heated pressurized liquid medium, whereby part of the liquid medium spontaneously vaporizes, the remainder remaining as liquid, and raises the internal energy of the working space;

(4) in an expansion cycle, allowing the volume of the working space to increase thereby driving the rotor, and causing some recondensation of the vaporized medium to occur;

(5) exhausting a mixture of liquid and gaseous heat-transfer medium from the working space and leaving in the working space residual heat-transfer medium;

(6) receiving said exhausted mixture of liquid and gaseous heat-transfer medium in a trap; and

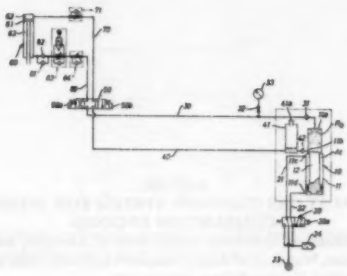
(7) recycling heat-transfer medium in the liquid state from the trap to step (2) for the generation of further pressurized heated liquid heat-transfer medium.

4,437,309

PNEUMATIC-HYDRAULIC SYSTEM FOR HYDRAULIC ACTUATOR

Osamu Suzuki, Toyohashi; Kunio Yamaguchi, Okazaki, and Meguru Yamamoto, Toyokawa, all of Japan, assignors to Toyooko Kogyo Kabushiki Kaisha, Japan

Filed Apr. 10, 1981, Ser. No. 253,151
Claims priority, application Japan, Apr. 22, 1980, 55-53959
Int. Cl.³ B60T *13/00*
U.S. Cl. 60—547.1 **4 Claims**



1. A pneumatic-hydraulic system for driving a hydraulic actuator under control of hydraulic pressure converted from pneumatic pressure, said system comprising:

a single pneumatic-hydraulic converter which includes a cylinder casing provided with inlet and outlet ports, and a plunger reciprocably disposed within said casing to subdivide the interior of said casing into a hydraulic chamber in open communication with said inlet and outlet ports and a pneumatic chamber for connection to a pneumatic pressure source, said hydraulic chamber having a displacement capacity for storing a predetermined amount of hydraulic fluid necessary for producing at least one reciprocating motion of said hydraulic actuator during forward movement of said plunger into said hydraulic chamber;

a supply passage connected with said outlet port for supplying the pressurized hydraulic fluid from said hydraulic chamber to said actuator, and a return passage connected with said inlet port for returning the hydraulic fluid discharged from said actuator to said hydraulic chamber;

first change-over valve means arranged in its first position to connect said pneumatic chamber to the pneumatic pressure source for effecting the forward movement of said plunger and arranged in its second position to connect said pneumatic chamber to atmospheric pressure for effecting backward movement of said plunger;

second change-over valve means for switching over the hydraulic connections of said supply and return passages to and from said actuator when said first change-over valve means is maintained in its first position;

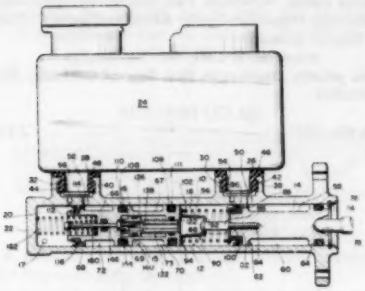
a hydraulic fluid reservoir disposed at its lower portion within said return passage to store the discharged hydraulic fluid therein and being provided at its upper portion with an air breather, the capacity of said reservoir being substantially the same as or larger than the displacement capacity of said hydraulic chamber; and

check valve means disposed within said return passage between said inlet port and said reservoir for permitting the flow of hydraulic fluid from said reservoir into said hydraulic chamber and for interrupting the reverse flow of hydraulic fluid from said hydraulic chamber.

4,437,310
TANDEM MASTER CYLINDER WITH A PRESSURE REGULATING VALVE FOR AN AUTOMOTIVE VEHICLE BRAKE SYSTEM

Katuhiro Morita, Yokohama, and Hitoshi Kubota, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 22, 1981, Ser. No. 256,487
Claims priority, application Japan, Apr. 24, 1980, 55-55199[U]
Int. Cl.³ B60T 11/20
U.S. Cl. 60—562 18 Claims



1. A tandem master cylinder in a hydraulic brake system for an automotive vehicle comprising:

a cylinder housing having an axially extending bore therein;

primary and secondary pistons axially aligned within said cylinder housing bore in tandem relationship with each other for movement in response to application of a braking force;

primary and secondary pressure chambers defined within said bore by said primary and secondary pistons, said primary chamber being located between said primary and secondary pistons, and said secondary chamber being defined by an end of the cylinder housing bore and said secondary piston and communicating with respective front wheel cylinders via a single secondary port;

a fluid reservoir communicating with said primary and secondary pressure chambers for supplying working fluid thereto; and

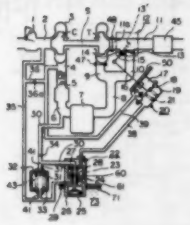
a single pressure control valve assembly provided in said secondary piston, said valve assembly including a bore formed in said secondary piston and extending along the longitudinal axis thereof, a thrustable cylinder having an axially extending opening therein and an annular projecting portion defining first and second chambers between the outer periphery of said thrusting cylinder and internal periphery of said secondary piston bore, a valve member and a valve seat incorporated with said thrusting cylinder for motion therewith, said first chamber communicating with said primary pressure chamber via said opening and a space between said valve member and said valve seat, said thrusting cylinder being movable between a first initial position wherein said valve seat is spaced from said valve member to permit fluid flow therethrough to establish fluid communication between said primary pressure chamber and said first chamber and a second position wherein said valve seat abuts said valve member for blocking fluid communication between said primary pressure chamber and said first chamber, said thrusting cylinder being responsive to the pressure difference between said first chamber and said primary pressure chamber for alternating the valve position between said first and second position; and

a single primary port communicating with rear wheel cylinders, said primary port communicating with said first chamber through a radial passage formed in said secondary piston.

4,437,311
APPARATUS FOR CONTROLLING THE FLOW OF EXHAUST GAS IN AN INTERNAL COMBUSTION ENGINE WITH A TURBOCHARGER AND A CATALYTIC CONVERTER

Kenzi Iwamoto, Nishio, and Katsuhiro Omata, Souwamachi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 4, 1982, Ser. No. 374,894
Claims priority, application Japan, May 7, 1981, 56-065031
Int. Cl.³ F01N 5/04; F02B 37/00
U.S. Cl. 60—602 8 Claims



1. An apparatus for controlling the flow of the exhaust gas in an internal combustion engine including a turbocharger having a compressor in an intake duct and having an exhaust gas driven turbine in an exhaust duct connected to the compressor, a catalytic converter arranged in the exhaust duct downstream of the turbine, and a throttle valve arranged in the intake duct between the engine and the compressor to control the engine output, said apparatus comprising a bypass passage which bypasses the turbine and which extends between the upstream and downstream sides of the turbine, a waste gate valve unit which controls the amount of the exhaust gas passing through the waste gate valve unit, an actuator for actuating the waste gate valve unit, which has first and second pressure chambers separated by a spring biased diaphragm, and a thermal switching valve unit which selectively connects one of the pressure chambers of the actuator with the atmosphere or the intake duct downstream of the throttle valve, the other pressure chamber of the actuator being connected to the intake duct downstream of the compressor and upstream the throttle valve by means of a conduit which is connected to an atmospheric pressure area via a restriction.

4,437,312
RECOVERY OF POWER FROM VAPORIZATION OF LIQUEFIED NATURAL GAS

Charles L. Newton, Bethlehem, and Dennis L. Fuini, Schnecksville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 6, 1981, Ser. No. 241,183
Int. Cl.³ F01K 17/00
U.S. Cl. 60—648 5 Claims

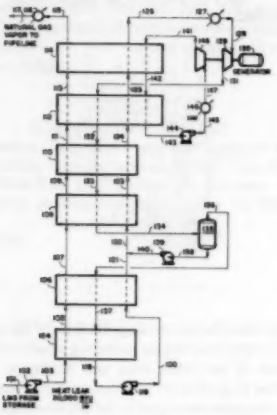
1. A method for recovering net power from the vaporization of liquefied natural gas against multicomponent streams, which method comprises the steps of:

(a) at least partially liquefying a first multicomponent stream with said liquefied natural gas as the liquefied gas is vaporized.

(b) phase separating said first multicomponent stream of step (a) into a vapor phase, which is further cooled to liquefaction against vaporizing liquefied natural gas, and a liquid phase, which is pumped to an elevated pressure.

(c) pumping said liquefied vapor phase multicomponent

stream of step (b) to an elevated pressure and combining the same with the liquid phase from the phase separation,
(d) warming and at least partially vaporizing said first multicomponent stream by cooling and at least partially liquefying a second multicomponent stream,
(e) heating and fully vaporizing said first multicomponent stream,
(f) expanding said heated and vaporized first multicomponent stream through a first expander,
(g) recovering power from said first expander,
(h) recycling said expanded first multicomponent stream to be at least partially liquefied.



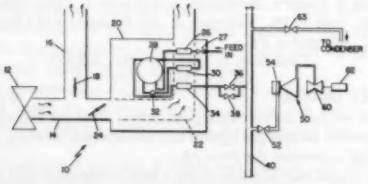
(i) pumping said at least partially liquefied second multicomponent stream to an elevated pressure,
(j) heating and vaporizing said second multicomponent stream,
(k) expanding said second multicomponent stream through a second expander.
(l) recovering power from said second expander, and
(m) recycling said expanded second multicomponent stream to be at least partially liquefied by heat exchange with said first multicomponent stream.

4,437,313

HRSG DAMPER CONTROL

Bruce D. Taber, Boxford, and James B. Wagner, Malden, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Nov. 9, 1981, Ser. No. 319,436
Int. Cl.³ F01K *13/02, 23/06*
U.S. Cl. 60—665 **10 Claims**



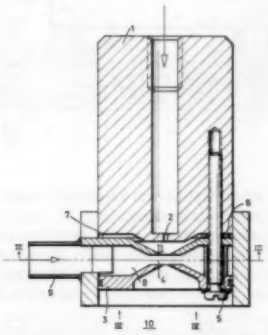
1. An apparatus for controlling the operation of a steam turbine system for a combined cycle power plant comprising:
a damper control,
a temperature rate controller, and
a drum level controller,
said damper control comprising means for receiving a first signal from said temperature rate controller and a second signal from said drum level controller, and means for producing a control signal based on either said first or second signal,
said control signal being fed to damper positioner means which adjusts the angle of a damper control system including an isolation damper and a bypass damper for an HRSG based on the value of said control signal.

4,437,314

ATOMIZER NOZZLE FOR CONTINUOUS FUEL INJECTION

Karl-Heinz Collin, Wehrheim, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,518
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026832
Int. Cl.³ F02C *7/18*
U.S. Cl. 60—738 **2 Claims**



1. An atomizer nozzle arrangement specifically used for continuously injecting fuel into a combustion chamber of a gas turbine engine, wherein the nozzle atomizes the fuel without utilizing moving parts and with minimum utilization of intake air, the nozzle arrangement comprising in combination:
an air intake communicating with the combustion chamber;
a vaporizor tube within the combustion chamber;
a nozzle body positioned within the vaporizor tube in spaced relating therewith to define a space therebetween through which space a portion of the intake air passes; the nozzle body having a bore therethrough for delivering fuel therethrough, the bore having a fuel outlet of a smaller diameter than the bore, from which outlet a spray of fuel is ejected;
a circular chamber in the nozzle body and positioned downstream from the outlet, through which chamber the spray of fuel passes, the chamber having a back wall through which the outlet of the bore passes;
an annular body having a hollow interior and disposed in the circular chamber in spaced relation to the back wall of the chamber to define a space between the back wall of the chamber and annular body; the hollow annular body having an axial opening coincident with the axis thereof which opening is aligned with but spaced from the outlet of the bore and through which the spray of fuel and air from said hollow annular body pass; the hollow annular body having a front wall and a rear wall each of which have concave portions adjacent the axial opening;
an opening communicating the space between the back wall of the chamber and the annular body with the space between the vaporizor tube and nozzle body for pressure equalization;
an air supply conduit connected radially with the interior of

the hollow annular body for supplying pressurized air thereto, and

means for interrupting air flow through the air supply conduit so that the air supply can be stopped when the temperature of the combustion chamber reaches operating temperature.

4,437,315

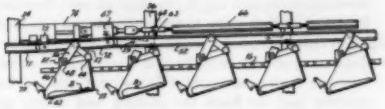
FLEXIBLE BAG COOLING ARRANGEMENT

Albert F. Rica, Stockton; Lloyd F. Hay, Oakdale; John R. Heron, Danville; John R. Webber, and Steven A. Rechtsteiner, both of Stockton, all of Calif., assignors to FranRica Mfg. Inc., Stockton, Calif.

Division of Ser. No. 286,065, Jul. 23, 1981, Pat. No. 4,384,463. This application Dec. 20, 1982, Ser. No. 451,722

Int. Cl.³ F25D *13/06*

U.S. Cl. 62—63 **5 Claims**



1. A method for cooling a heated flowable material in a flexible bag comprising the steps of:

(a) moving the bag in a carrier through a cooling area;

(b) dispensing a cooling medium about the bag as it is moved through the cooling area;

(c) tilting the carrier in a first direction to lower a first portion of the bag relative to a second portion of the bag, altering the shape of the bag and increasing the amount of material in said first bag portion; and

(d) tilting the carrier in a second direction to lower said second bag portion relative to said first bag portion, altering the shape of the bag and increasing the amount of material in said second bag portion.

4,437,316

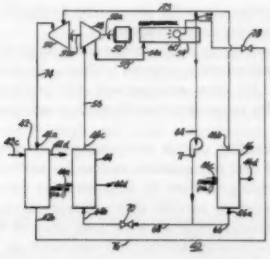
METHOD AND APPARATUS FOR RECOVERING WASTE ENERGY

David Dyer, Auburn, Ala., and James L. Wise, Depere, Wis., assignors to Technology Marketing Inc., Newport, R.I.

Filed Jan. 23, 1981, Ser. No. 227,774

Int. Cl.³ F25B *7/00*

U.S. Cl. 62—79 **55 Claims**



1. A method for waste heat recovery comprising the steps of:

separating a common supply of working fluid into first and second branches;

evaporating the working fluid in said first and second branches by means of first and second independent waste heat sources to increase the energy of the evaporated working fluids in each of said branches;

compressing the evaporated working fluid in said first branch;

desuperheating the compressed working fluid;

merging the working fluid evaporated in said second branch with the desuperheated working fluid;

compressing the merged working fluids; and

condensing the last-mentioned compressed working fluid by transferring the energy to a second working fluid whose energy is significantly increased.

4,437,317

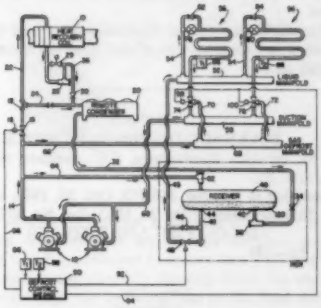
HEAD PRESSURE MAINTENANCE FOR GAS DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Filed Feb. 26, 1982, Ser. No. 352,473

Int. Cl.³ F25B *41/00*; F25D *21/06*

U.S. Cl. 62—81 **49 Claims**



1. In a refrigeration system having a compressor means for compressing refrigerant fluid, a compressor discharge conduit for conducting compressed refrigerant gas to a condenser means in which the compressed refrigerant gas is condensed to a liquid; and an evaporator means connected between said condenser means and said compressor means to provide refrigeration by evaporating liquid refrigerant from said condenser means and for returning the refrigerant gas formed to the intake of said compressor means; the improvement comprising:

defrost conduit means for selectively conducting gaseous refrigerant during a defrost cycle from said compressor discharge conduit to said evaporator means for defrosting said evaporator means;

a selectively controllable valve means connected in said compressor discharge conduit downstream from the connection of said defrost conduit means to said discharge conduit and upstream from said condenser means, said controllable valve means operably maintained in substantially opened position during a refrigeration cycle; and

an operator associated with said selectively controllable valve means for closing said valve means at the start of a defrost cycle for immediately increasing the pressure of the refrigerant gas within said defrost conduit means up to a predetermined level at the start of a defrost cycle, and said controllable valve means operable thereafter for substantially maintaining by modulation an increased pressure in said defrost conduit means throughout said defrost cycle.

4,437,318

ENVIRONMENTAL CONTROL SYSTEM AND METHOD

Bertil R. L. Werjefelt, 277 Kaha St., Kailua, Hi. 96734

Filed Sep. 10, 1979, Ser. No. 73,612

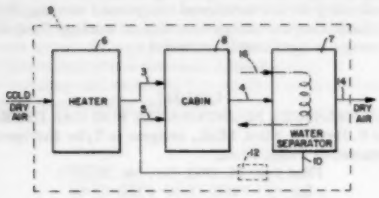
Int. Cl.³ F25D *17/06*

U.S. Cl. 62—93 **12 Claims**

1. An aircraft cabin humidification system for humidifying a fresh air mass entering the cabin, said system comprising:

(a) removal means for at least partially removing moisture from an air mass;

(b) replacement means for at least partially replacing said air mass with fresh air, said replacement means including means for exhausting said air mass from said cabin and said



aircraft and for maintaining said moisture on said aircraft; and

(c) humidification means for humidifying said fresh air by adding at least a portion of said removed moisture to said fresh air.

4,437,319

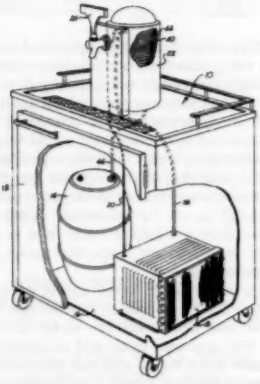
BEVERAGE DISPENSING DEVICE

Frank M. Iannelli, Spartanburg, S.C., assignor to Tannetics, Inc., Erie, Pa.

Continuation of Ser. No. 316,873, Oct. 30, 1981, abandoned. This application May 26, 1983, Ser. No. 497,437

Int. Cl.³ F25C *1/00*; F25D *3/00*

U.S. Cl. 62—138 **2 Claims**



1. A refrigeration system for cooling a beverage as said beverage is drawn from a keg comprising:

a containaer having a vertically extending wall and a top and bottom;

an evaporator coil carried adjacent the wall of said container extending vertically from adjacent the bottom of said container to adjacent the top of said container;

refrigeration condensing means circulating a refrigerant through said evaporator coil cooling said container;

a beverage dispensing coil centrally carried within said container extending vertically from adjacent the bottom of said container to adjacent the top of said container;

water carried within said container;

a temperature sensor immersed in said water and being operably connected to said refrigeration condensing means for maintaining said water at a predetermined temperature;

said beverage dispensing coil having a predetermined outside diameter so as to provide a space between said inside wall of said container and said beverage dispensing coil for allowing a bank of ice to build up on said inside wall;

said elongated temperature sensor extending vertically downwardly in a space between said ice bank and said beverage dispensing coil from adjacent the top of said container to adjacent the bottom thereof for activating said refrigeration condensing means responsive to predetermined changes in the temperature of said water;

said elongated vertically extending temperature sensor permitting the thickness of said ice bank to build up substantially for handling peak load use of said system while ensuring that said ice bank does not touch said beverage dispensing coil;

a manually operated tap carried adjacent the top of said container connected to one end of said beverage dispensing coil;

tubular means connecting said keg to said other end of said beverage dispensing coil so that upon opening said tap, beverage from said keg flows through said dispensing coil for being cooled prior to flowing out said top, and

a power driven propeller means carried within said beverage dispensing coil for moving said water carried in said container in a circular motion for wiping said ice bank for melting said ice bank for cooling said water and said beverage dispensing coil, said flow path being substantially unimpeded between the output of said propellor and said ice bank.

4,437,320

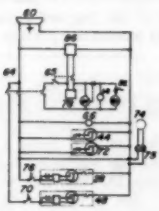
TRANSPORTER AIR CHILLER

Claes E. Eklund, 1347 W. Trenton Ave., Orange, Calif. 92667

Filed May 11, 1982, Ser. No. 377,079

Int. Cl.³ F25B *27/00*

U.S. Cl. 62—236 **7 Claims**



1. A transporter air chiller for cooling foodstuffs in airborne storage and serving carts comprising:

(a) a unitized vapor cycle refrigeration apparatus having a pair of refrigeration systems within a single frame and a common air flow arrangement for providing product cooling by removing heat through a refrigerant cooling agent;

(b) an alternating circuit electrical power circuit integral with said first refrigeration system for activating cooling and providing air flow by electromotive means;

(c) an alternating current and a direct current electrical power system integral with said second refrigeration system for cooling, storing and providing air flow of said common arrangement;

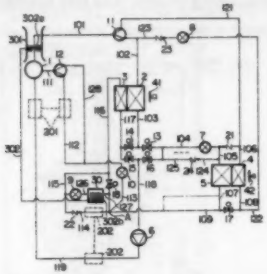
(d) an air damper within said air flow arrangement rotatably attached on one side to said frame for isolating air flow from said first and second refrigeration systems allowing cooling effect from either circuit not in concert; and,

(e) an insulated compartment in said chiller for housing the high pressure side of said refrigeration systems providing thermal isolation from the balance of said apparatus due to inherent low heat transfer characteristics while allowing ambient air to circulate through said refrigeration systems.

4,437,321
ABSORPTION COOLING AND HEATING SYSTEM

Setsuro Asai, Shimizu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 416,042
Claims priority, application Japan, Sep. 11, 1981, 56-142309
Int. Cl.³ F25B 13/00
U.S. Cl. 62—324.2 8 Claims



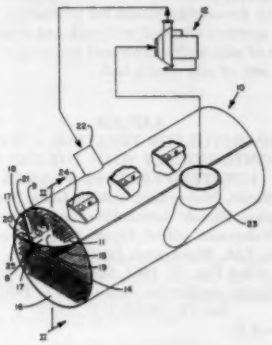
1. In an absorption cooling and heating system comprising:
a generator;
two outdoor heat exchangers;
an expansion valve for cooling;
an expansion valve for heating;
an expansion valve for defrosting;
two indoor heat exchangers;
a pressure reducing valve for solutions;
a solution pump; and
a plurality of valves for switching between channels;
wherein the first of said two outdoor heat exchangers functions as a condenser, said two indoor heat exchangers function as evaporators and the second outdoor heat exchanger functions as an absorber in a cooling mode, wherein said first indoor heat exchanger functions as a condenser, said two outdoor heat exchangers function as evaporators and said second indoor heat exchanger functions as an absorber in a heating mode, and wherein said two outdoor heat exchangers function as condensers and said second indoor heat exchanger functions as an absorber in a defrosting mode; the improvement comprising:
a heat accumulator located downstream of the expansion valve for defrosting and serving as a channel for a refrigerant; and
heat pipe means having a heat releasing end inserted in said heat accumulator and a heat source end inserted in a waste heat flue of a burner for heating said generator, whereby in a defrosting mode a refrigerant flowing from the condensers and having its pressure reduced by the expansion valve absorbs the waste heat of the burner for heating the generator through said heat accumulator, to be heated thereby and vaporize.

4,437,322
HEAT EXCHANGER ASSEMBLY FOR A REFRIGERATION SYSTEM

Richard E. Ertinger, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 3, 1982, Ser. No. 373,953
Int. Cl.³ F25B 39/02
U.S. Cl. 62—504 15 Claims

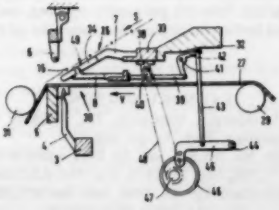
1. A heat exchanger assembly comprising
a shell enclosing a heat transfer tube bundle to form a shell and tube type heat exchanger;
a partition means inside the shell for dividing the tube bundle into at least a condenser section and a flash subcooler section with each section having a number of tubes passing therethrough to provide sufficient cooling for condensing gaseous refrigerant directly in each section;
an inlet means into the condenser section for providing a passageway for flow of refrigerant into the shell side of the condenser section;
at least one orifice means in the partition means for providing a passageway for the flow of the refrigerant from the condenser section to the flash subcooler section, said orifice means sized and positioned to regulate refrigerant flow between the condenser section and the flash subcooler section to provide a selected pressure difference between the condenser section and the flash subcooler section which is sufficient to ensure that a portion of any liquid refrigerant normally flowing from the condenser section through the orifice means to the flash subcooler section is flashed in the subcooler section to absorb heat from the remaining liquid refrigerant which flows into the flash subcooler section; and
an outlet means from the flash subcooler section for providing a passageway for the flow of the refrigerant out of the flash subcooler section.



4,437,323
WARP KNITTING MACHINE WITH WEFT INSERTION MAGAZINE AND SUBSTRATE PROVISION ARRANGEMENT

Gerhard Hittel, Rodgau; Hubertus Mühl, Heusenstamm; Franz Eigl, Obertshausen, and Werner Langer, Heusenstamm, all of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinen fabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,125
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1981, 3140480
Int. Cl.³ D04B 23/06
U.S. Cl. 66—84 A 11 Claims



1. A warp knitting machine for delivering weft threads and a substrate at a relative acute angle along a weft path and a separate, substrate path to a needle bed having a needle bar, said machine comprising:

a weft thread magazine for transversely laying said weft threads across the breadth of said machine in parallel on said weft path, upstream of said needle bed, said weft path and needle bar being on opposite sides of said substrate path;

a substrate providing means for delivering said substrate along said substrate path;

a holding means, having at least one barrier aperture, for limiting the mobility along at least one of said paths, said holding means and needle bar being on opposite sides of said substrate path; and

at least one forwarding means for protruding through said barrier aperture into said weft path and separating a leading one of said weft threads and bringing it to the downstream side of said needle bed.

4,437,324

APPARATUS FOR TREATING A CLOTH CONTINUOUSLY WITH THE USE OF LOW-TEMPERATURE PLASMA

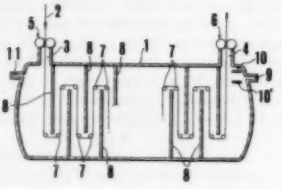
Yoshikazu Sando, Wakayama; Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Hiroshi Ishidoshiro, and Matsuo Minakata, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Dec. 27, 1982, Ser. No. 452,786

Claims priority, application Japan, Jan. 6, 1982, 57-818

Int. Cl.³ D06B *3/12, 23/00*

U.S. Cl. 68—5 E **2 Claims**



1. An apparatus for treating a cloth continuously with the use of low-temperature plasma, comprising a reactor provided with seal mechanisms which can allow continuous taking in and out of a cloth to be treated through the reactor while maintaining the interior of the reactor under a reduced pressure, a plurality of cloth guide rolls provided up and down in the reactor for transporting the cloth zigzag forming snaky undulations, a plurality of partition walls provided up and down alternately in the reactor for forming zigzag cloth passages to transport the cloth therebetween forming snaky undulations, a gas supply opening provided in the vicinity of the cloth outlet of the reactor for jetting a gas to the zigzag cloth passages, a pair of electrode plates provided adjacent to the gas supply opening for producing low-temperature plasma with combined use of high frequency electric wave applied thereto and the gas jetted from the gas supply opening, and a vacuum duct provided in the vicinity of the cloth inlet of the reactor.

4,437,325

LAUNDRY MACHINE

Doran D. Hershberger, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 304,536, Sep. 22, 1981, which is a division of Ser. No. 77,784, Sep. 21, 1979, Pat. No. 4,327,302. This application Apr. 22, 1983, Ser. No. 487,922

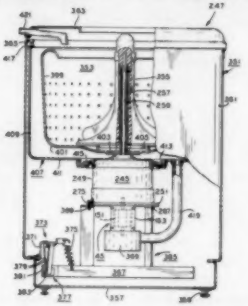
Int. Cl.³ D06F *23/04, 37/40*

U.S. Cl. 68—23.7 **23 Claims**

12. A laundry machine adapted for operation in at least a wash mode and a spin mode comprising:

means for agitating water and fabrics to be laundered thereby to wash the fabrics during the wash mode and for thereafter spinning the fabrics to effect centrifugal displacement of water from the fabrics during the spin mode;

an electronically commutated motor for driving said agitating and spinning means, said electronically commutated motor comprising a stator, a multi-stage winding arrangement associated with said stator and including a plurality of winding stages adapted to be electronically commutated in a plurality of preselected sequences, and rotatable means associated with said stator and adapted for selective magnetic coupling relation with said winding stages so as



to be rotatably driven thereby, said rotatable means being rotatably driven in one direction during the spin mode in response to the electronic commutation of at least some of said winding stages in one of the preselected sequences and being rotatably driven in the one direction and another direction opposite thereto during the wash mode in response to the electronic commutation of said winding stages in another of the preselected sequences; and

means for driving said agitating and spinning means from said rotatable means.

4,437,326

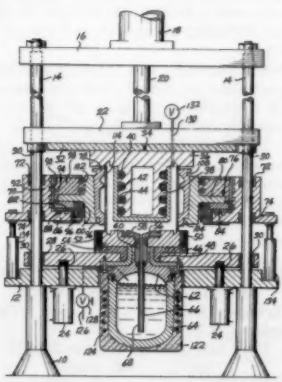
BULGE FORMING METHOD AND APPARATUS

Arne H. Carlson, 2202 "A" St., Tacoma, Wash. 98402

Filed Jun. 7, 1982, Ser. No. 385,838

Int. Cl.³ B21D *22/10*

U.S. Cl. 72—62 **31 Claims**



1. Bulge forming apparatus, comprising:

annular die means defining a central opening and presenting a radially inwardly directed annular die face;

support means for supporting an annular workpiece within said central opening, in close proximity to said annular die

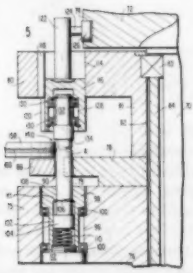
face including upper and lower support members for contacting upper and lower ends of the workpiece; and means for pressure feeding molten metal into the workpiece, for both heating the workpiece and pressing it radially outwardly into forming contact with the die face, to conform the workpiece to the shape of the die face.

4,437,327

METHOD AND APPARATUS FOR CIRCUMFERENTIALLY GROOVING THIN-WALLED CYLINDRICAL METAL OBJECTS

James A. Madden, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Jan. 5, 1982, Ser. No. 337,199
Int. Cl.³ B21D *17/04*
U.S. Cl. 72—94 **37 Claims**



1. An improved apparatus for progressively circumferentially grooving a thin-walled cylindrical object having a first axis and an open end, said apparatus comprising:

a source of said objects;

means for removing said objects from said source and delivering them along a circular path about a fixed second axis in spaced relation to each other, the rate of movement of said objects along said path being essentially constant;

means for supporting and for permitting rotation of each object about said first axis, as the object moves along said path;

rotating means rotating about a fixed third axis for engaging each object to progressively form a radially inwardly extending, circumferential groove in the wall thereof as the object rotates while moving along said path, said second fixed axis spaced apart from said third fixed axis, said object rotating about its first axis more than one revolution while in engagement with said rotating means thereby permitting said progressive forming; and

means for removing each object from said path following formation of said circumferential groove.

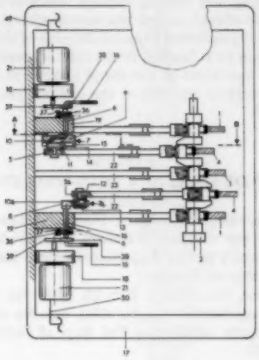
4,437,328

CRANKSHAFT GLAZE OR SMOOTH ROLLING MACHINE

Helmut Wittkopp, and Valentin Büschgens, both of Erkelenz, Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,190
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108780
Int. Cl.³ B21H *7/00*
U.S. Cl. 72—110 **4 Claims**

1. A crankshaft rolling machine comprising a base, means on said base for mounting a crankshaft for rotation about a fixed axis, a least one rolling fixture movably mounted on said base, said fixture including rolling dies, a pair of crank assemblies each having a main pin mounted on said machine, said main pins being rotatable about parallel axis, said crank assemblies each including a crank pin offset from the axis of its said main pin, adjustable connecting means interposed between said crank pins and said main pins of each said crank assembly for variably offsetting said crank pins in a radial direction from the



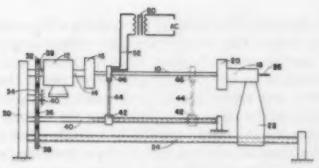
axis of said main pins, motion transmitting means coupling each said crank pin to said rolling fixture, and drive means connecting said crank assemblies for synchronously rotating said main pins about said parallel axis.

4,437,329

METHOD OF MANUFACTURING TWISTED TUBES

Elmo W. Geppelt, and William H. Poore, both of Tulsa, Okla., assignors to Delta Limited, Tulsa, Okla.

Filed Aug. 21, 1981, Ser. No. 295,143
Int. Cl.³ B21D *7/00, 11/14*
U.S. Cl. 72—299 **3 Claims**



1. A method of manufacturing a spiraled tube comprising:

(a) positioning an elongated cylindrical mandrel within a tube;

(b) grasping the tube adjacent the first end with a motor driven headstock;

(c) grasping the tube adjacent the second end with a non rotating tailstock;

(d) forming at least one point of reduced resistance to torsional force on the wall of the tube, which step may be accomplished before or after steps (a) and (b);

(e) rotating the headstock by means of said headstock motor to initiate and extend the formation of at least one spiral groove in the tube, the mandrel defining the minimum interior diameter of the spiraled tube so formed;

(f) driving a first and a second lead screw by means of said headstock drive motor;

(g) advancing said tailstock towards said head stock by

coupling said first lead screw to said tail stock to compensate for the reduction in length of the tube as the spiral groove is formed;

(h) supporting a heating element adjacent the tube;

(i) advancing said heating element towards said headstock by means of said second lead screw whereby said heating element is positioned adjacent the area of the tube wherein spiral groove is formed as the tube is rotated to raise the area of formation of the spiral groove to a temperature above ambient and below the melting point of the tube material.

4,437,330

METHOD OF MAKING A THIN-WALLED BEARING BUSHING

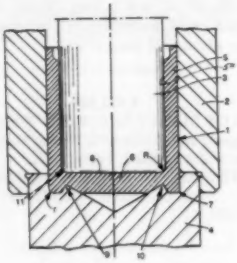
Armin Olschewski, Schweinfurt; Hermann Hetterich, Heidenfeld, and Peter Horling, Mainberg, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Division of Ser. No. 218,520, Dec. 22, 1980, Pat. No. 4,377,313. This application Sep. 24, 1982, Ser. No. 423,129

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952092

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—358 **2 Claims**



1. A deep drawing method for making a thin-walled bearing bushing from a flat circular member comprising a cylindrical sleeve section and a bottom section closing one end of the sleeve section having an outer peripheral rim at the juncture of the sleeve and bottom sections of small cross sectional radius consisting of the steps of cold pressing the bottom section and deep drawing the sleeve section in a single press stroke in the bore of a generally cylindrical die by a drawing ram engaging in the bore of the die and a cooperating counter ram positioned at the open end of the die confronting the bottom section, and simultaneously impressing an annular groove in one face of the bottom section closely adjacent the junction of the bottom and sleeve sections to effect radial outward displacement of the material in the bottom section into the area of the peripheral rim and uniform compression thereof in this area.

4,437,331

UNIVERSAL TRANSMISSION COUPLING AND A PROCESS FOR MANUFACTURING SUCH A COUPLING

Jacques Dore, Colombes, France, assignor to Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Dec. 29, 1981, Ser. No. 335,577

Claims priority, application France, Jan. 2, 1981, 81 00025

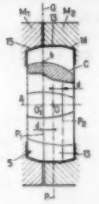
Int. Cl.³ B21K *1/76*

U.S. Cl. 72—360 **3 Claims**

1. A process for manufacturing an inner element of a universal coupling having an outer element integral with a first shaft having a spherical cavity inside which are formed grooves; said inner element integral with a second shaft and having an external surface in which grooves are also formed, equal in number to those of the outer element, the section of the bottoms of the grooves of the inner element through a plane passing through the axis of this element being formed by an arc of a curve, said inner element being placed inside the outer element; and rolling means, such as balls, being disposed in the housings formed by the pairs of grooves of the outer element and of the inner element, these rolling means being retained in windows of a cage disposed between the inner element and the outer element;

said process comprising the step of:

forging said inner element by a single precise forging operation, particularly cold or semi-hot forging, by forming said



inner element with two dies having an imprint corresponding to the shape complementary to that of the parts of the inner element to be formed and having a single joint plane orthogonal to the axial direction of the inner element and located so as to contain the points of the bottoms of the grooves of the inner element the furthest away from the axis, said inner element being forged with a cylindrical surface portion extending from said joint plane and continued on each side by spherical surface portions for mating with the corresponding spherical inner surfaces of the cage.

4,437,332

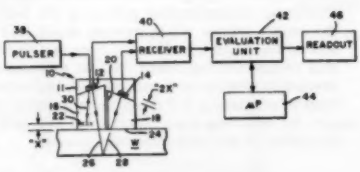
ULTRASONIC THICKNESS MEASURING INSTRUMENT

Richard J. Pittaro, West Redding, Conn., assignor to Krautkramer-Branson, Inc., Lewistown, Pa.

Filed Sep. 30, 1982, Ser. No. 429,127

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—1 DV **12 Claims**



1. A dual-element ultrasonic probe comprising in combination a pair of elongated plastic coupling means arranged in substantially parallel juxtaposition in slightly spaced acoustically isolated relation, each of said coupling means acting as a delay line for ultrasonic signals passing therethrough between respective oppositely disposed end surfaces, each such coupling means having a respective electroacoustic transducer element coupled to a respective first end surface and the opposite second end surfaces of both coupling means adapted to be coupled for simultaneous acoustic contact with a workpiece, the improvement comprising:

one of said coupling means characterized by length L having a reflector disposed at a longitudinal distance X from its second end surface for partially reflecting ultrasonic signals transmitted from its respective first end surface disposed transducer element, and

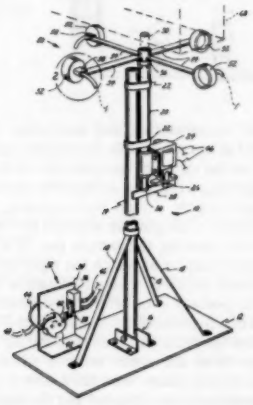
the other coupling means characterized by length equal to L−2X.

4,437,333

APPARATUS AND METHOD FOR ASBESTOS FIBER RELEASE POTENTIAL

David Hands, Southfield, Mich., assignor to Clayton Environmental Consultants, Inc., Southfield, Mich.

Filed Jun. 1, 1982, Ser. No. 383,689
Int. Cl.³ G01N 3/38
U.S. Cl. 73—12 18 Claims



1. Portable test apparatus for in situ testing of the asbestos fiber release potential to ambient air of an asbestos containing composition comprising an impact member adapted to impact the exterior surface of the composition, means for operating said impact member so as to cause it to repeatedly impact a selected area of the exterior surface of the composition over a given time interval and cause a release of asbestos fibers to ambient air representative of the asbestos fiber release potential of the composition, and a collector system comprising one or more filters disposed adjacent the area of impact each having an open collection face exposed to ambient air for collecting released asbestos fibers in ambient air.

4,437,334

METHOD AND APPARATUS FOR DETECTING KNOCKING COMBUSTION

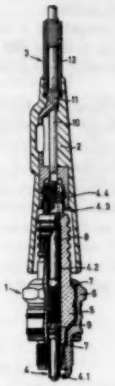
Werner Laurenz, Aachen, Fed. Rep. of Germany, assignor to Franz Pischinger, Aachen, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,260
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105245
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 22 Claims

1. A method of detecting knocking combustion during the operation of an externally auto-ignited internal combustion engine, said method comprising the steps of:

detecting the radiation emitted by the combustion chamber gases, which radiation changes during knocking combustion;

conveying said radiation to a processing device; and



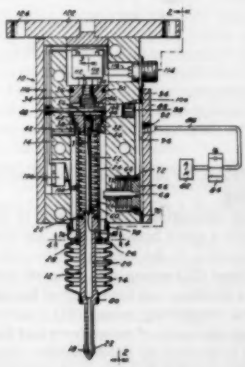
ascertaining from the detected radiation the knock-signal energies for each cycle.

4,437,335

GAUGE AND METHOD OF DETERMINING THE EXISTENCE OF IRREGULARITIES IN A SURFACE OF AN ARTICLE

Donald C. Gates, Troy, Mich., assignor to Antares Engineering, Inc., Troy, Mich.

Filed Dec. 2, 1981, Ser. No. 326,728
Int. Cl.³ G01B 5/28
U.S. Cl. 73—37.9 26 Claims



19. A gauge for determining the existence of irregularities in a surface of an article comprising;

a housing;

a probe means having a fluid outlet for the passage of fluid under pressure therethrough;

means mounting said probe means within said housing for movement between a neutral position and a sensing position;

a sensor means for detecting the pressure of the fluid in said sensing position of said probe means;

a thrust rod being reciprocally movable and engageable with said probe means for selectively urging said probe means towards said sensing position;

said fluid outlet of said probe means being closely parallel to the movement of and opening away from said thrust rod;

said mounting means including a pivot joint for allowing said probe means to pivot between said neutral position and said sensing position;

said pivot joint comprising a female pivot means fixedly secured with said housing and a male pivot means;

said probe means being operatively connected to said male pivot means;

said female pivot means including a radially inwardly extending first flange, said male pivot means including a second flange extending outwardly and radially therefrom, said second flange being seated upon said first flange and within said female pivot means whereby said second flange of said male pivot means rocks within said female pivot means so as to pivot said probe means between said neutral position and said sensing position; and a micro switch disposed within said housing for sensing when said probe means is pivoted beyond said sensing position.

4,437,336

DEVICE OF INTEGRATING A SMALL AMOUNT OF FLOW OF FLUID FOR LEAK DETECTION

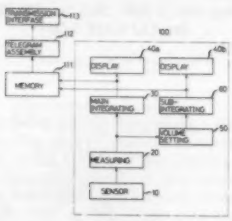
Takeshi Abe, Yokohama, Japan, assignor to Ricoh Co. Ltd., Japan

Filed Nov. 19, 1980, Ser. No. 208,318

Claims priority, application Japan, Nov. 20, 1979, 54-150456; Aug. 14, 1980, 55-111991

Int. Cl.³ G01M *3/28*; G08B *21/00*

U.S. Cl. 73—40.5 R **4 Claims**



1. A device for integrating a small amount of flow of fluid comprising:

(a) flow measuring means capable of generating a series of pulses, a space between the pulses being varied in inverse proportion to the measured flow rate of fluid;

(b) a timer (51) arranged to generate periodic timing signals for a deciding unit time interval for taking a measurement;

(c) first integrating means (61) connected to receive and count the series of pulses from said flow measuring means and to be reset by the respective timing signals from said timer, said first integration means producing corresponding values of the measured flow rate to which the counted number of pulses per unit time interval pertains;

(d) a leakage decision unit (50-1) for comparing the corresponding value of the measured flow rate from said first integrating means with a predetermined reference value corresponding to a normal lower limit for the rate of flow usually consumed and providing a leakage detection signal at a time when the corresponding value of the measured flow rate is less than the reference value; and

(e) second integrating means (62, 63) for integrating the corresponding value of the measured flow rate from said first integrating means in response to the leakage detection signals from said leakage decision unit.

4,437,337

VISCOELASTOMETER

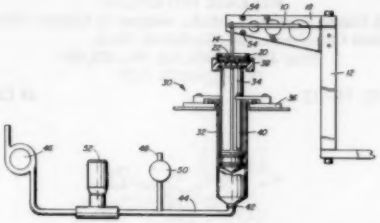
Walter J. Fenrick, Medicine Hat, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Oct. 6, 1981, Ser. No. 309,164

Claims priority, application Canada, Aug. 31, 1981, 384906

Int. Cl.³ G01N *11/10, 13/02*

U.S. Cl. 73—54 **8 Claims**



1. Apparatus for measuring and displaying a viscoelastic effect in a liquid as a reproducible force/time signature which can be related to the viscosity and elasticity of the liquid, said apparatus comprising a resilient, deflectable cantilever extending from a rigid support, a rigid rod extending downwardly from the cantilever, a sample cup adapted to contain a liquid sample, means for moving the sample cup at a selected rate between an upper position at which the rigid rod is immersed to a predetermined depth in a liquid contained in the sample cup and a lower position at or before which occurs relaxation and separation of a filament of the liquid which forms between the rigid rod and the surface of the liquid during movement of the sample cup from the upper position toward the lower position, strain sensing means associated with a portion of the cantilever intermediate the rigid rod and the rigid support for sensing the strain which occurs during the formation and subsequent relaxation and separation of the filament, and display means associated with the strain sensing means for displaying the sensed strain as a function of time to provide a reproducible force/time signature which can be related to the viscosity and elasticity of the liquid.

4,437,338

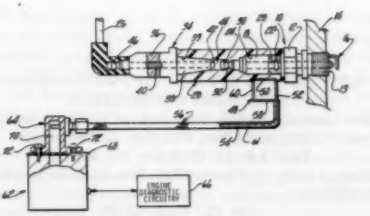
SPARK PLUG MICROWAVE ADAPTER

Scott E. Wilson, Ann Arbor, Mich., assignor to Jodon Engineering Associates, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 192,728, Oct. 1, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,205

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 **14 Claims**



1. An adapter for coupling microwave energy into a combustion chamber of an internal combustion engine through a spark plug of the type which includes an insulator housing and a spark conduction path, said adapter comprising means

shaped so as to be adapted to be removably and snugly received over the spark plug insulator housing, and a microwave antenna mounted on said means and adapted to be coupled to a source of microwave energy for transmitting said microwave energy through said means and through the spark plug insulator housing into the engine chamber in a waveguide transmission mode.

4,437,339
LINEARIZING AND CONTROL CIRCUIT FOR AIR FLOW RATE METER

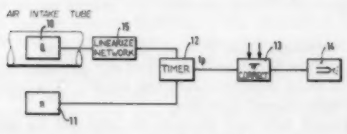
Ulrich Drews, Vaihingen; Peter Rapps, Karlsruhe, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,090

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038498

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **5 Claims**



1. An electronically controlled circuit for air flow measurement comprising:

an air intake tube

an air flow rate meter device in the air intake tube and producing an output, and

a linearizing circuit layout responsive to the output of the device, the linearizing circuit layout functioning to produce an output in accordance with different voltage dividers determining point-slope values selected by the output of the device for voltage-to-current conversion, whereby a total current is formed from the sum of individual currents dependent on the respective voltage dividers.

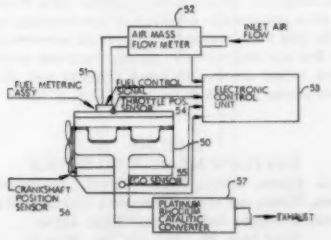
4,437,340
ADAPTIVE AIR FLOW METER OFFSET CONTROL

Csaba Csere, Ypsilanti, and William C. Follmer, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 23, 1981, Ser. No. 324,287

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **14 Claims**



5. A method for calibrating an air flow meter for an internal combustion engine capable of operating in a closed-loop mode and an open-loop mode comprising:

operating the internal combustion engine in a closed loop mode so as to achieve a desired air fuel ratio;

sensing the exhaust gas to determine the actual air fuel ratio;

determining any difference between the actual and desired air fuel ratio, the leakage of air downstream of the air flow meter being a function of said difference; and

adjusting the fuel supply so that the air fuel ratio is adjusted toward the desired air fuel ratio thereby compensating for any leakage of air downstream of the airflow meter.

4,437,341
APPARATUS FOR MEASURING AN INJECTION AMOUNT

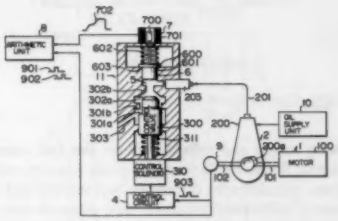
Shinzo Ito, Aichi; Tateshi Kato, Anjo; Takumi Noma, Okazaki; Soichiro Sugimoto, Okazaki, and Seigi Toiyama, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 19, 1982, Ser. No. 369,427

Claims priority, application Japan, Apr. 21, 1981, 56-60414

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **1 Claim**



1. An apparatus for measuring an injection amount comprising:

an injection chamber to be charged with liquid injected from an injection device under measurement;

a prime mover for driving the injection device;

a liquid injection regulator operable in response to the rotation angle of a shaft of the prime mover, said liquid injection regulator having two seal sections for sealing said injection chamber and a liquid discharge port, respectively, and a control valve, said control valve having portions thereof which constitute parts of the two seal portions, wherein when discharging the liquid, said control valve departs from said injection chamber to release said two seal sections to thereby connect the injection chamber to the discharge port and after completion of the discharge of liquid, returns to said liquid injection chamber while sealing said liquid discharge port to thereby raise pressure in said injection chamber;

a displacement member which displaces in accordance with a change in the volume of said injection chamber;

a displacement detector which converts a displacement of the displacement member into an electrical signal; and

an arithmetic unit which arithmetically processes the electrical signal from the displacement detector to display an injection amount of the liquid injected from the injection device under measurement.

4,437,342
DIAGNOSTIC SYSTEM FOR DETECTING FAULT IN FUEL SYSTEM OF ENGINE HAVING ELECTRONIC FUEL INJECTION SYSTEM

Akio Hosaka; Akito Yamamoto, and Katsunori Oshiage, all of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 15, 1982, Ser. No. 388,606

Claims priority, application Japan, Jul. 8, 1981, 56-105677

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **6 Claims**

1. A fault diagnostic system for detecting faults in a fuel system of an engine with an electronic fuel injection system, comprising:

means for determining the injection quantity of fuel injected

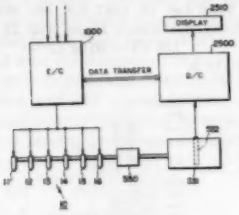
by injector means by summing the length of the injector opening time of each injection,

means for measuring the residual quantity of fuel remaining in a fuel tank for the engine,

means for calculating the consumption quantity of fuel removed from the fuel tank by calculating the amount of a decrease of the residual fuel quantity measured by said residual quantity measuring means,

checking means which receives information on the fuel injection quantity from said fuel injection quantity determining means and information on the fuel consumption quantity from said fuel consumption quantity calculating means, calculates the difference between the fuel injection quantity of a predetermined time interval and the fuel consumption quantity of the same time interval, checks if the difference is within a predetermined permissible range, and produces an abnormal signal when the difference is outside the range,

indicating means for producing a fault signal indicative of the existence of a fault in response to said abnormal signal.



4,437,343

AIRSPEED SENSING SYSTEMS

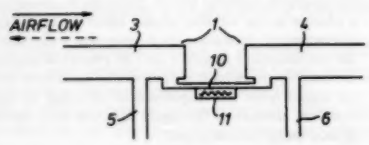
James M. Dixon, Lymington, and Geoffrey R. Witt, Dorset, both of England, assignors to Penny & Giles Transducers Limited, United Kingdom

Filed Mar. 19, 1982, Ser. No. 359,800

Claims priority, application United Kingdom, Mar. 24, 1981, 8109242

Int. Cl.³ G01C 21/10

U.S. Cl. 73—182 **4 Claims**



1. An airspeed sensing system comprising:

a tube arrangement which in use is exposed to airflow, said tube arrangement including a first tube and a second tube aligned with one another, said first tube having a first open-ended portion to face substantially directly into said airflow and said second tube having a second open-ended portion to face in substantially the opposite direction;

a restricted passage connecting said first and second portions, the diameter of said passage being small relative to the diameters of said first and second portions;

a resistive element disposed within said restricted passage for the purpose of deriving a temperature measurement; and

means for obtaining an airspeed indication in dependence on pressures in said first and second portions, respectively.

4,437,344

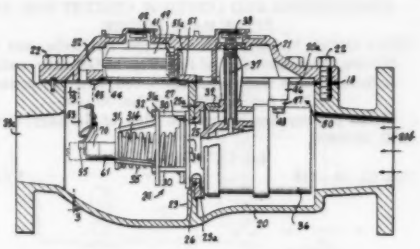
COMPOUND LIQUID FLOW METER WITH FAST CROSSOVER CHARACTERISTIC

William G. Karjalainen, Tallassee, Ala., assignor to Neptune Water Meter Company, Tallassee, Ala.

Filed Jan. 25, 1982, Ser. No. 342,132

Int. Cl.³ G01F 7/00

U.S. Cl. 73—197 **5 Claims**



1. A compound liquid flow meter, comprising:

a. a first flow path between an inlet and an outlet, including a first meter accurate over a first range of flow rates above a predetermined flow rate;

b. a second flow path between the inlet and the outlet, including a second meter accurate over a second range of flow rates below and overlapping said first range;

c. first valve means controlling the flow through said first meter and biased toward closed position, said valve means being subject to the pressure difference between the inlet and the outlet, said pressure difference being effective to open the valve means against its bias when the pressure difference exceeds a predetermined value corresponding to a flow rate in the overlapping portion of said ranges;

d. second valve means controlling the flow through the second meter, said second valve means being movable between a minimum flow position and an open position and being moved toward said open position by the flow through said second meter;

wherein the improvement comprises:

e. means mounted on the first valve means and movable with respect thereto in response to the pressure difference between the inlet and the outlet, said last-named means being effective when the pressure difference exceeds a value slightly smaller than said predetermined value to initiate movement of the second valve means toward its minimum flow position, said initial movement of said second valve means being effective to increase the pressure difference to said predetermined value even though the flow rate remains constant, so that opening movement of the first valve means is initiated and movement of both the first and second valve means continues until the first valve means reaches its open position and the second valve means reaches its minimum flow position.

4,437,345

GAS FLOW MEASURING DEVICE

Tsuneyuki Egami, Aichi; Hisasi Kawai, Toyohashi; Tokio Kohama, Nishio, and Hideki Obayashi, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 30, 1982, Ser. No. 363,450

Claims priority, application Japan, Apr. 1, 1981, 56-49803

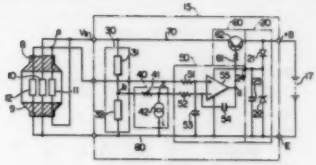
Int. Cl.³ G01F 1/68

U.S. Cl. 73—204 **6 Claims**

1. A gas flow measuring device comprising an electric heater installed in a pipe through which a gas to be measured flows, a first temperature dependent resistor installed at the downstream side of the electric heater within said pipe, a second temperature dependent resistor installed at a position substantially free from heat produced from said electric heater within

said pipe, and a measuring circuit for measuring the flow of a gas to be measured by using output signals of said electric heater and first and second temperature dependent resistors,

wherein said measuring circuit includes a reference resistor circuit for forming a bridge having diametrical nodes together with said first and second temperature dependent resistors, a constant voltage adding circuit having a resistor and a constant current source connected in parallel with the reference resistor circuit to provide a constant current thereto for applying a constant voltage to one of



said diametrical nodes of the bridge, a differential amplifier circuit having two inputs for amplifying the differential voltage between the other of the diametrical nodes of said bridge and the output of said constant voltage adding circuit at said one of said nodes, the resistor of said constant voltage adding circuit being connected between one of said nodes and one of said inputs, and an electrical amplifier circuit for amplifying the output voltage of said differential amplifier circuit and for controlling the voltage to be applied to said electric heater and said bridge.

4,437,346

MILKMETER MEASURING THE WEIGHT OF THE QUANTITY OF MILK ISSUED BY A COW, AND DEVICE FOR TAKING SAMPLES ADAPTED FOR USE WITH SAID MILKMETER

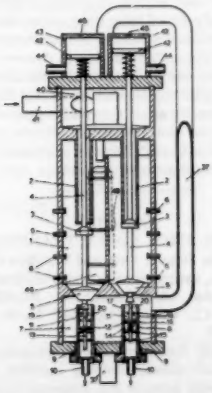
Jan Kummer, Oostergrachtswal 91-95, 8921 AB, Leeuwarden, Netherlands

Filed Nov. 9, 1981, Ser. No. 319,612

Claims priority, application Netherlands, Nov. 14, 1980, 8006246; May 13, 1981, 8102359

Int. Cl.³ G01F *11/00*

U.S. Cl. 73—221 **12 Claims**



1. A milkmeter for intermittantly determining the weight of a quantity of milk issued by a cow during milking, comprising a measuring container, a supply valve and a discharge valve for supplying and discharging the milk to and from the container respectively, an elongated float movable freely in a vertical direction in said measuring container, in response to the level of milk therein, the upper end of said float being provided with a means which cooperates with switch means mounted in a stationary position in opposition to said float over the upper end of the measuring container, said switch acting to close the milk supply valve and to open the milk discharge valve when contacted by the upper end of the float, the distance between the lower end of said float and the maximum milk level in said measuring container when said float is contacted with the switch, being large relative to the spacing of the lower end of said float from the bottom of said measuring container.

4,437,347

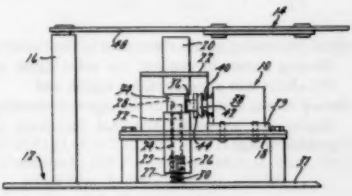
SHUT-OFF ACTUATING DEVICE

Robert J. Bronsky, New Baltimore; Dennis B. Clark, Flat Rock; Jeffrey A. McKeen, Detroit, and William A. Przybylski, Dearborn, all of Mich., assignors to Michigan Consolidated Gas Company, Detroit, Mich.

Filed Jan. 18, 1982, Ser. No. 340,377

Int. Cl.³ G01F *15/00*

U.S. Cl. 73—272 R **23 Claims**



1. In a fluid flow device having a flow-sensing apparatus including linkage means operable in response to said fluid flow, said apparatus being adapted to prevent said fluid flow through said device when said linkage means is inoperative, the improvement comprising shut-off means for rendering said linkage means inoperative and actuating means for selectively actuating said shut-off means, thereby preventing said fluid flow through said device, said shut-off means further including a stop member interferingly engageable with said linkage means and biasing means biasing said stop member into said interfering engagement with said linkage means, said actuating means including an actuating arm engageable with said stop member to hold said stop member out of said interfering engagement with said linkage means, said actuating arm being selectively moveable out of said engagement with said stop member, thereby allowing said biasing means to urge said stop member into said interfering engagement with said linkage means.

4,437,348

ULTRASONIC IMAGING APPARATUS

Hiroshi Sasaki, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 7, 1982, Ser. No. 386,081

Claims priority, application Japan, Jun. 8, 1981, 56-86902

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—625 **13 Claims**

1. An ultrasonic imaging apparatus comprising:

an ultrasonic transducer comprised of a plurality of ultrasonic transducer elements;

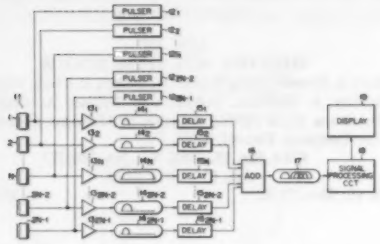
drive means for supplying drive pulses to the transducer elements of the ultrasonic transducer to cause ultrasonic beams to be emitted from the transducer elements;

prestage filtering means connected to the transducer elements to receive from the transducer elements echo signals corresponding to echo waves and filter the echo signals respectively in accordance with its different frequency characteristics;

composing means for composing filtered echo signals from

the prestage filtering means to obtain a composite echo signal;

variable band pass filtering means connected to the composing means to filter the composite echo signal therefrom in accordance with its varying filtering characteristics, thereby to sequentially extract echo signal components corresponding to said different frequency characteristics;



signal processing means connected to the variable band pass filtering means to convert the echo signal components therefrom into a tomographic signal; and

display means connected to the signal processing means to display the tomographic signal therefrom as a tomographic image.

4,437,349

VORTEX FLOW METER FREQUENCY ADJUSTMENT

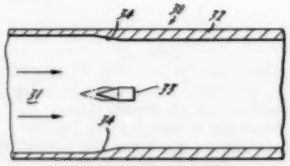
Robert D. Joy, Cedar Rapids, Iowa, assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01265, § 371 Date Sep. 16, 1982, § 102(e) Date Sep. 16, 1982

PCT Filed Sep. 16, 1982, Ser. No. 434,141

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **8 Claims**



1. A device for generating vortices in a bounded fluid stream comprising:

a fluid flow duct means for passing a fluid stream;

a generator means for generating vortices positioned in said duct in the fluid stream;

an adjustment means for varying the cross sectional area of the fluid flow adjacent said generator means; and wherein said generator means and said adjustment means include:

an elongated plate member having a rotationally movable axis of elongation with respect to the direction of flow of the fluid, so that a different cross section can be presented to the fluid flow.

4,437,350

VORTEX FLOW METERING APPARATUS

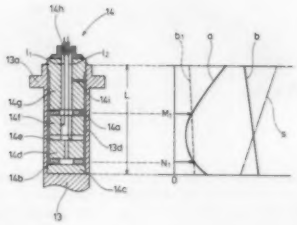
Hisashi Tamura; Ichizo Ito; Masashi Hirayama, and Tetsuo Ando, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,078

Claims priority, application Japan, Oct. 6, 1981, 56-159060

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.24 **6 Claims**



1. A vortex flow metering apparatus, comprising converter means, said converter means comprising

a first conversion amplifier having an input and an output,

a second conversion amplifier having an input and an output,

an operator circuit having an input and an output, and means for connecting said outputs of said first conversion amplifier and of said second conversion amplifier to said input of said operator circuit;

detector means, said detector means comprising

a vortex generator having an axis and defining a concavity,

a first piezoelectric sensor disposed within said concavity,

a second piezoelectric sensor disposed within said concavity,

means for connecting said first piezoelectric sensor to said input of said first conversion amplifier, and

means for connecting said second piezoelectric sensor to said input of said second conversion amplifier; and

wherein said first piezoelectric sensor and said second piezoelectric sensor are selectively arranged at to points along said axis of said vortex generator whereat ratio of noise component due to vibration of said vortex generator according to disturbance vibration and ratio of noise component due to duct strain according to disturbance vibration are substantially equal, and ratio of signal component due to vortex dynamic lift and ratio of signal component due to disturbance vibration are different from each other, whereby signals from said first and second piezoelectric sensors are applied to said inputs of said first and second amplifiers, and after processing thereat, supplied to said input of said operator circuit, thereby to remove noise components caused by disturbance vibrations.

4,437,351

CONTROL STICK FORCE TRANSDUCER

Harold J. McGrann; John F. Orn, and Matthew C. Pallaver, all of Phoenix, Ariz., assignors to Sperry Corporation, NY, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,415

Int. Cl.³ G01L *5/16*; B64C *13/04*

U.S. Cl. 73—862.05 **9 Claims**

1. A zero-moment force transducer apparatus adapted for use with an aircraft manual control member and disposed between a grip handle portion and lower portion of a control member and disposed along a normally vertical axis, comprising:

a first plate connected with said grip handle portion;

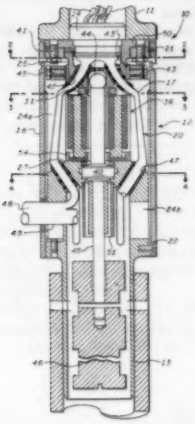
a second plate spaced apart from said first plate and connected with said lower control portion; said first and second plates being disposed in normally parallel horizontal planes and normally aligned along said vertical axis;

at least three elongated laterally compliant columns connect-

ing said first plate with said second plate and which together therewith define at least three parallelogram configurations disposed in planes parallel with said vertical axis and each column having compliances such that one of said plates may be reflected relative to the other in all lateral directions upon corresponding forces being applied to said one plate;

a platform disposed intermediately of said first and second plates;

a common inductive pick-off means having a first part connected with said first plate and a second part mounted on



said platform and connected with said platform for providing output signals representative of said relative lateral deflection of said plates in response to lateral forces applied to said grip handle portion, said pick-off further being substantially non-respective to moments about said vertical axis, and

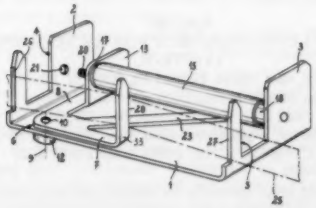
an acceleration responsive mass and pivoted rod means connected with said mass, said rod means coupled with said first plate for inducing forces on said first plate to compensate for corresponding acceleration forces acting on said grip handle portion.

4,437,352

APPARATUS FOR MEASURING BELT TENSION

Albert H. Deborde, and Michel F. Volland, both of Bourgoin Jallieu, France, assignors to Saurer-Diederichs (Societe Anonyme), Bourgoin Jallieu, France

Filed Jan. 22, 1982, Ser. No. 341,828
Claims priority, application France, Jan. 30, 1981, 81 02186
Int. Cl.³ G01L *5/06*
U.S. Cl. 73—862.47 **16 Claims**



8. An apparatus for measuring the tension in a straight strand such as a belt, said apparatus comprising:

an elongated housing having a pair of opposite longitudinal ends formed with respective generally parallel end plates having structure edges facing transversely in the same direction and generally defining a plane, one of said end plates having a face;

a two-arm lever pivoted on said housing between said ends and having an abutment arm extending transversely between said ends and a measuring arm extending generally longitudinally of said housing and having an arm edge lying between said structure edges and facing transversely opposite to said structure edges;

pivot means supporting said lever on said housing for angular motion about an axis transverse to said housing between two end positions with said one arm edge lying on opposite sides of said plane;

spring means braced between said abutment arm and said face of said one end plate for urging said lever into the end position with said arm edge between said plane and said housing; and

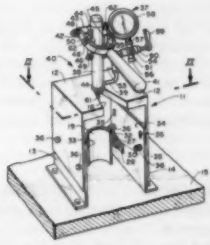
means including a pointer and indicia on said lever and housing for indicating the angular position of said lever.

4,437,353

PRESSURIZED CONTAINER TESTING APPARATUS

R. Dean Hamerlinck, 620 Pope St., St. Helena, Calif. 94574

Filed May 7, 1982, Ser. No. 375,999
Int. Cl.³ G01N *1/22*
U.S. Cl. 73—863.81 **11 Claims**



1. Apparatus for piercing a cork sealing off the neck of a bottle adapted to contain a liquid therein comprising:

a housing having guide means thereon for receiving a bottle and aligning said bottle so that said bottle is disposed in an upright position with the cork sealing off the neck of said bottle having its upper surface exposed to the atmosphere wherein said guide means includes a top wall on said housing having a tapered slot therein for receiving the neck of a bottle;

a cylinder having an internal movable piston therein disposed on said housing above said guide means, said piston carrying a downwardly extending hollow cork piercing needle having an eye at the lower end fluidly communicating with a longitudinally extending opening therein and its longitudinal axis aligned with substantially the center of said cork upper surface, said piston being movable from a first position whereby the point of said needle is disposed above the upper surface of said cork to a second position whereby said needle pierces said cork and the eye thereof enters said bottle below the lower surface of said cork; and including a handle pivotally connected to said cylinder having linkage means interconnecting said handle to said piston whereby said piston is movable between its first and second positions by pivotal movement of said handle.

4,437,354

TORQUER ASSEMBLIES FOR GYROSCOPE APPARATUS

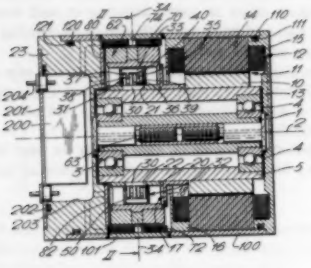
Nicholas R. Capaldi, Cheltenham, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jul. 20, 1981, Ser. No. 285,193

Claims priority, application United Kingdom, Jul. 29, 1980, 8024746

Int. Cl.³ G01C *19/30*

U.S. Cl. 74—5.46 **11 Claims**



1. A torquer assembly for producing a restoring force on a rotatable member of gyroscope apparatus, about an axis substantially at right angles to the axis of rotation of the rotatable member, wherein the torquer assembly comprises: a permanent magnet assembly; means mounting said permanent magnet assembly with said rotatable member so as to produce a magnetic field directed substantially radially of the axis of rotation of said rotatable member; an electric coil assembly including an annular member of magnetic material fixedly mounted with said gyroscope apparatus radially outwards of said permanent magnet assembly, and a plurality of coils mounted on the inner surface of said annular member within the field of said permanent magnet assembly, a part of the magnetic field produced by said coils being directed through said annular member.

4,437,355

BEVEL GEAR POWER TRANSMITTING GEAR TRAINS

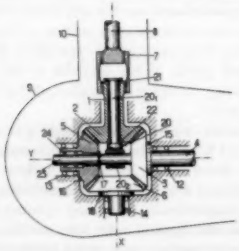
Andre Bordat, Rueil Malmaison, France, assignor to Constructions Mecaniques de Normandie, Paris, France

Filed Apr. 27, 1981, Ser. No. 257,609

Claims priority, application France, Apr. 29, 1980, 80 09702

Int. Cl.³ F16H *35/00, 35/06, 57/00, 1/14*

U.S. Cl. 74—385 **5 Claims**



1. Bevel gear power transmitting gear train comprising a first bevel gear coupled to a driving shaft, a second bevel gear coupled to a driven shaft with axis perpendicular to that of the driving shaft and engaging with the first one, a third loose bevel gear coaxial with the second one and engaging with the first one and a fourth loose bevel gear coaxial with the first one and engaging with the second and with the third, one of the first two gears being mounted slightly "floating", characterized in that the "floating" gear (2) is pivotably mounted for rotation about its axis X, but without freedom for axial movement, on a rigid body (20) itself pivotably mounted about the common axis Y, perpendicular to X, of the two gears (3, 5) with which the floating gear (2) is in engagement, with freedom for axial movement along this axis Y.

4,437,356

GEAR

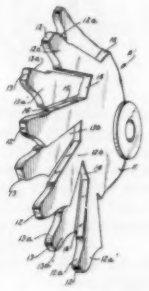
Mikiharu Imazaike, 26-1 Nishi, 2-chome, Tezukayama, Sumioshi-ku, Osaka, Japan

Filed Mar. 4, 1981, Ser. No. 240,358

Claims priority, application Japan, Mar. 22, 1980, 55-37585; Mar. 22, 1980, 55-37586

Int. Cl.³ F16H *57/00, 55/14*

U.S. Cl. 74—411 **12 Claims**



1. A one-piece, integrally molded plastic gear for precision apparatus such as timepieces and acoustic devices and having elastically deformable teeth to provide cushioning properties to reduce noise and vibration during use, comprising a main body, two circumferential rows of teeth extending from said main body, said rows of teeth being axially offset with the teeth in one row being circumferentially offset relative to the teeth in the other row, each of said teeth having a terminating end portion and a longitudinally extending leg portion, each of said leg portions extending at an acute angle greater than zero degrees relative to a radial line of said gear, each of said terminating end portions defining a complete and integrally formed gear tooth, said leg portions of each of said teeth in each of said rows being circumferentially spaced from one another a distance which is greater than the circumferential width of each of said leg portions such that adjacent offset leg portions are circumferentially spaced from one another, whereby said teeth are elastically deformable in a circumferential direction to thereby reduce noise and vibration without inpairing the precision of the gear for use in precision apparatus.

4,437,357

DOUBLE LEVER ASSEMBLY FOR BICYCLE SPEED CONTROL

Nobuo Ozaki, and Mikio Hosokawa, both of Osaka, Japan, assignors to Maeda Industries, Ltd., Osaka, Japan

Filed Nov. 27, 1981, Ser. No. 325,125

Claims priority, application Japan, Nov. 28, 1980, 55-168393

Int. Cl.³ B62K *23/06*; G05G *9/00*; F16H *7/22*

U.S. Cl. 74—475 **3 Claims**

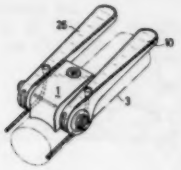
1. A double lever assembly for bicycle speed control comprising

a first shaft supported by a mounting block,

a first or rear derailleur operating lever mounted on said first shaft,

a second shaft supported by said mounting block,

a second or front derailleur operating lever mounted on said second shaft, and



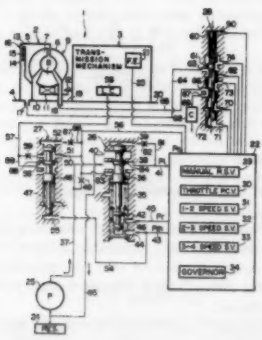
said second shaft being inter-connected with said first shaft through motion converting mechanism so that said second lever is reciprocated within a limited range in synchronism with pivotal movement of said first lever.

4,437,358

TRANSMISSION WITH TORQUE CONVERTER AND LOCK UP CLUTCH WITH LUBRICATION AND PRESSURIZATION SYSTEM

Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 29, 1981, Ser. No. 278,351
Claims priority, application Japan, Jul. 4, 1980, 55-91379
Int. Cl.³ B60K *41/02*
U.S. Cl. 74—867 **2 Claims**



1. An automatic transmission for an automotive vehicle, comprising:

(a) a gear transmission mechanism which comprises a lubricating system and which can provide a plurality of speed stages according to a selective supply of actuating hydraulic fluid pressure thereto;

(b) a hydraulic fluid pump which provides a supply of pressurized hydraulic fluid;

(c) a torque converter, which has two ports, the interior of which is filled with hydraulic fluid supplied from a selected one of said two ports, and which incorporates a lock up clutch which is selectively engaged or disengaged according to changing over of supply of hydraulic fluid pressure thereto between said two ports;

(d) a hydraulic fluid pressure control system which controls said gear transmission mechanism so as, according to operational parameters of said vehicle, to set said gear transmission mechanism to one or another of said plurality of speed stages;

(e) a line hydraulic fluid pressure control valve which receives a supply of pressurized hydraulic fluid from said hydraulic fluid from said hydraulic fluid pump and which provides a supply thereof, regulated to a line hydraulic fluid pressure level, to said hydraulic fluid pressure control system as a source of line pressure;

(f) a first throttle element;

(g) a torque converter hydraulic fluid pressure control valve which:

(g1) receives a supply of pressurized hydraulic fluid from said hydraulic fluid pump in parallel to said line hydraulic fluid pressure control valve via said first throttle element; and

(g2) provides a supply thereof to said torque converter as a source of torque converter hydraulic fluid pressure for filling the interior of said torque converter with hydraulic fluid and for selectively either engaging or disengaging said lock up clutch, said supply of torque converter hydraulic fluid pressure being regulated to a torque converter hydraulic fluid pressure level by said torque converter hydraulic fluid pressure control valve performing the action of, when said supply thereto of hydraulic fluid from said hydraulic fluid pump is pentiful, diverting therefrom a release flow of hydraulic fluid; and

(h) a second throttle element;

(i) said release flow of hydraulic fluid, when available, being supplied to said lubricating system of said gear transmission mechanism, and also said torque converter hydraulic fluid pressure being supplied to said lubricating system of said gear transmission mechanism via said second throttle element;

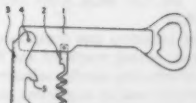
(j) whereby said torque converter hydraulic fluid pressure is always maintained at a level proportionally reduced as compared with said line hydraulic fluid pressure level, and, when said hydraulic fluid pump is producing a plentiful amount of flow of hydraulic fluid, and said torque converter hydraulic fluid pressure control valve is thus releasing a fairly large release flow of hydraulic fluid as diverted from said plentiful supply of hydraulic fluid from said pump, said lubricating system of said gear transmission mechanism is thus receiving an ample flow of lubricating hydraulic fluid, this ample flow being made up both of said release flow of hydraulic fluid, and also of said flow of hydraulic fluid from said torque converter hydraulic fluid pressure as provided through said second throttle element; but, when said hydraulic fluid pump is producing rather a small flow of hydraulic fluid, and said torque converter hydraulic fluid pressure control valve is not releasing any substantial release flow of hydraulic fluid as diverted from said supply of hydraulic fluid from said pump, said lubricating system of said gear transmission mechanism is still receiving a certain definite small amount of lubricating hydraulic fluid, from said torque converter hydraulic fluid pressure as provided via said second throttle element.

4,437,359

WINE WAITER'S CORKSCREWS

Andre Dejoux, 15, rue Lakanal, 75015 Paris, and Bruno Desnoulez, 76 Boulevard Koenig, 92200 Neuilly, both of France

Filed May 27, 1981, Ser. No. 267,454
Claims priority, application France, May 23, 1980, 80 11499
Int. Cl.³ B67B *7/04*
U.S. Cl. 81—3.38 A **4 Claims**



1. A corkscrew for removing a cork from the mouth of a bottle comprising a flat elongated handle having first and second ends, auger means positioned between said first and second ends and pivotally attached to said handle, and extrac-

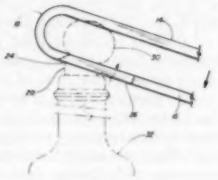
tion lever means secured to said handle about pivot means located at one of said first or second ends, said extraction lever means comprising first and second levers, each secured at one end thereof to said handle at said pivot means, said first lever including a first notch and said second lever including a second notch, and said first and second notches being located at first and second unequal distances away from said pivot means, whereby after screwing said auger into said cork, upon positioning the notch least distant from said pivot means against said bottle mouth, said handle is pivoted about said pivot means causing a first partial extraction of said cork from said bottle mouth, with subsequent complete removal of said cork from said bottle mouth being facilitated by thereafter positioning the other notch most distant from said pivot means against said bottle mouth and pivoting said handle about said pivot means, causing a second total extraction of said cork, via said auger pivoting about said pivot means, out of said bottle mouth in a two-step removal operation.

4,437,360

APPARATUS FOR CONTROLLED STOPPER EXTRACTION FROM AND REINSERTION IN SPARKLING WINE BOTTLES

Hal C. Becker, 4104 Sumter Sq., Fort Collins, Colo. 80525

Filed Feb. 23, 1983, Ser. No. 469,198
Int. Cl.³ B67B *7/06, 7/44*
U.S. Cl. 81—3.44 **2 Claims**



1. Apparatus for controlled stopper extraction from and reinsertion in sparkling wine bottles comprising:

(a) bifurcated tensile engaging means, having two parallel member means spaced apart by a closed curved end, and having oppositely disposed free handle ends for tensilely increasing and decreasing said spacing;

(b) one said member means defines a compound hole means of two contiguous holes, one hole for passing a stopper head and the other for slidably engaging said stopper body and stopper head lower edges;

(c) a second said member means defining a hollow opposing said other contiguous hole for simultaneously engaging said stopper top as said one said member means other hole slidably engages said stopper body.

4,437,361

TATTOOING GUN

Lester M. Steckel, Box 235, Taylor, Nebr. 68879, and Valeria J. Thomsen, P.O. Box 457, Burwell, Nebr. 68823

Filed Jan. 7, 1982, Ser. No. 337,776
Int. Cl.³ B43K *5/00;* **A61D** *1/00*
U.S. Cl. 81—9.22 **2 Claims**

1. An animal tattooing gun comprising,

a frame means having rearward and forward ends,

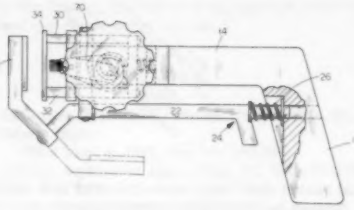
a plurality of tattooing needles selectively movably mounted at the forward end of said frame means,

said needles being movable between a rearward non-tattooing position to a forward tattooing position,

resilient means operatively connected to said needles for selectively rapidly moving said needles from their said non-tattooing position to their said tattooing position whereby said needles will penetrate a portion of the animal to create tattoo openings therein,

selective locking means for maintaining said needles in their said non-tattooing position,

and means at the forward end of said frame means for engagement with the animal and operatively connected to said locking means whereby sufficient pressure thereon will disengage said locking means to cause said needles to move to their said tattooing position.

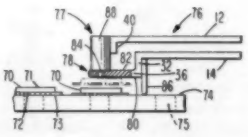


4,437,362

TOOLS FOR HANDLING MAGNETIC ARTICLES

Jerry C. Hurst, Reading, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,942
Int. Cl.³ B25B *9/02, 11/00*
U.S. Cl. 81—43 **5 Claims**



1. A tweezer tool for handling a magnetic article, comprising:

first and second elongated tweezer members, joined at one end and biased apart and tapered to substantially free ends where at least a portion of said first member is movable toward and away from a corresponding portion of said second member;

a substantially non-magnetizable and planar means for holding an article, said means having an aperture to pass flux therethrough and being associated with the free end of the second member whereat said means is interposed between the first member and contact with a surface of the article for releasably holding the same in cooperation with a magnetic field, said article being movable laterally along said holding means; and a substantially permanent magnet having a major and a minor portion and being

affixed to the free end of the first member, said magnet having only the minor portion formed and aligned to enter the aperture in the holding means, said magnet being of sufficient strength and being removably applied by operation of the first member in stages to:

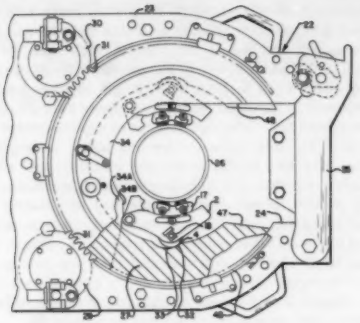
pick up an article by establishing the magnetic field of sufficient strength relative to the weight and material of the article and to any opposing external forces acting thereupon that said article is preferentially attracted to the holding means when the tool is applied to pick up the article, and

to release an article from the tool by withdrawing the magnet and the field, the article being restrained by the holding means until gravity and any other opposing external forces overcome the attraction of the withdrawing field and said article separates from the tool.

4,437,363
DUAL CAMMING ACTION JAW ASSEMBLY AND POWER TONG

Charles W. Haynes, Spring, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jun. 29, 1981, Ser. No. 278,293
Int. Cl.³ B25B 17/00
U.S. Cl. 81—57.18 25 Claims



1. A jaw assembly for use in a power tong for axially rotating an axially elongated body which comprises:

a jaw frame carried by the power tong for movement into and out of engagement with said axially elongated body;

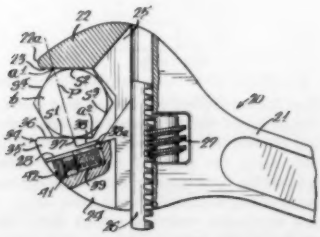
a cam follower means connected to said jaw frame and adapted to cooperate with a cam surface portion of said power tong to impart a primary camming action of the jaw frame into and out of engagement with said axially elongated body, and;

a die assembly slidably mounted to said jaw frame allowing relative motion between itself and said jaw frame in at least two directions along a camming surface of contact with said jaw frame and cooperating with said jaw frame providing a second camming action which radially increases the force of said die assembly against the axially elongated body independently of the primary camming action of the jaw frame upon engagement with said body and said relative motion in either of said at least two directions.

4,437,364
NUT WRENCH

Werner W. Martinmaas, 3461 Cashill Blvd., Reno, Nev. 89509

Filed Feb. 17, 1981, Ser. No. 235,027
Int. Cl.³ B25B 13/12
U.S. Cl. 81—179 20 Claims



1. In a wrench for rotating a fastener having angularly related flat surfaces surrounding an axis of rotation, said wrench having a handle, a first jaw member with a first gripping face and a second jaw member with a second gripping face effectively parallel to said first gripping face, and said faces defining a forwardly open jaw to slidably engage extensive parts of opposite flat surfaces of a fastener to turn said fastener during forward rotation of the wrench, and improvement which permits the wrench to be reverse rotated without turning the fastener, said improvement comprising:

the second jaw member provides a slideway which diverges from the first jaw member toward the front of the jaw;

a slide member mounted for fore-and-aft movement along said slideway, said slide member having said second gripping face thereon which engages a substantial part but less than the entirety of one of said flat surfaces of a fastener, and said second gripping face terminating at a rear face that extends toward the slideway at an angle to the second gripping face, said rear face defining the front of a recess which also has a lower defining surface, the dimensions of said recess being great enough and the relationship between said rear face and said lower defining surface being such that during reverse rotation of the wrench an apex of a fastener may be received in said recess free of contact with either defining surface thereof;

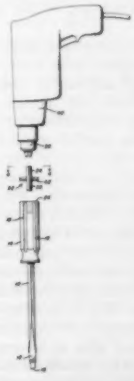
and spring means on the wrench lightly biasing said slide member rearwardly to a normal position;

the angle of divergence of the slideway, the length of the second gripping face, and the forward travel of the slide member being such that reverse rotation of the wrench while engaged with opposite flat surfaces of a fastener causes one of said flat surfaces to pivot about the slide member apex between said second gripping face and said rear face while the fastener apex that defines the rear of said one of said flat surfaces is received in said recess free of contact with the slide member and thus cam the slide member forwardly against the bias of the spring means a sufficient distance that the jaw members span said fastener apex and the directly opposite fastener apex during said reverse rotation, whereby the jaw members override said opposite apices and the spring means returns the slide member to its normal position with the second gripping face in engagement with the next flat surface of the fastener.

4,437,365
SCREWDRIVER

Yigal Y. Yaari, 42 Kirkwood Rd., Brighton, Mass. 02135

Filed Mar. 8, 1982, Ser. No. 356,203
Int. Cl.³ B25G 1/00
U.S. Cl. 81—436 2 Claims



1. A screwdriver capable of being operated manually or automatically comprising:

a shank, a tip formed at the free end of the shank adapted to engage the head of a screw,

a handle permanently fixed on the other end of the shank by which the screwdriver may be operated manually,

said handle having a well, non-circular in cross section, extending axially in the handle from the handle end remote from the shank,

and a coupling having one end with a cross-sectional shape that conforms to the cross-section of the well and fitting snugly into the well but removable therefrom so that the screwdriver may be operated manually without interference from the coupling, said coupling having a second end that is adapted to be engaged by the chuck of a power drill so that the screwdriver may be powered by a power drill when the coupling is connected both to the power drill chuck and the handle.

4,437,366

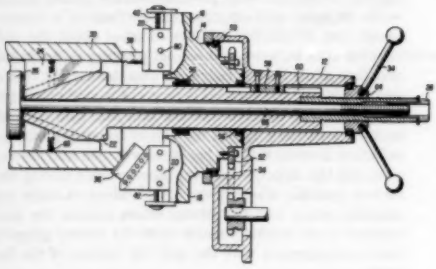
TOOL CARRIER FOR PORTABLE LATHE

William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool, Inc., Rancho Cordova, Calif.

Filed Apr. 3, 1981, Ser. No. 250,680

Int. Cl.³ B23B *3/22, 29/00*

U.S. Cl. 82—4 C **4 Claims**



1. In a portable lathe for preparing pipe ends for welding including a hollow tool carrier rotatable about a longitudinal cutting axis of symmetry; a mandrel shaft extending axially through the tool carrier; a pipe engaging mandrel on the distal end of said mandrel shaft; means for expanding the mandrel into a pipe engaging position to secure the lathe in an adjustably set location relative to a pipe end; said tool carrier rotatable relative to said mandrel shaft and moveable towards and away from the distal end of the mandrel; the improvement comprising:

said tool carrier comprising three radially extending circumferentially spaced arms each including a flat tool slide facing towards a pipe end position; each tool slide including a tool holder slide surface; a clamp means for releasably securing a tool holder to the slide surface; each tool slide including parallel opposed female bevel gibs extending along the side edges of the tool slide to form a dovetail tool slide; each tool holder connected to a respective tool slide including upstanding side edges extending normal to the respective tool slide surface parallel to the side edges of the tool slide, and a tool slide engaging bottom surface; each tool holder including female bevel gibs in its upstanding side edges extending parallel to the gibs in the sides of a respective associated tool slide; each clamp means comprising a pair of gibs brackets removably secured to the opposite side edges of a respective tool holder and including male bevel gibs at its opposite edges, said brackets each spanning the distance between respective female gibs in a tool slide and associated tool holder; said gibs all including a bevel surface inclined from the center line of a respective tool slide and tool carrier extending toward the outer edges of the slide and carrier towards the abutting tool holder and tool slide surfaces; said male gibs being complementary in form to the female gibs and arranged to engage the female gibs in camming relationship along the bevel surfaces to thereby cause clamping together of a respective tool holder bottom surface and an associated tool slide when they are in assembled position; each tool holder including a first aperture extending parallel to its respective tool slide and parallel to the tool holder side edges, and means therein for engaging the threads of a threaded shaft; a rotatable threaded shaft extending through each said aperture, each shaft being retained in fixed axial position relative to a tool slide to which it is connected; and means for rotating each shaft to move each tool holder relative to and parallel with its respective tool slide when at least a single gib bracket associated therewith is loosened from its clamping position; at least one of said tool slides including an elongated undercut slot area in its slide surface extending along its length; the respective tool holder associated with said tool slide including the slot area including a second aperture extending normal to said first aperture and terminating at its bottom surface opposite said undercut slot area, said second aperture being adapted to receive an elongated cutting tool; whereby said undercut area prevents interference between said tool slide and a cutting tool that is positioned in said second aperture so as to extend beyond the bottom surface of the respective tool holder.

4,437,367

PROCESS AND APPARATUS FOR CONTROLLING THE CUTTING FEED OF BAND SAW MACHINES

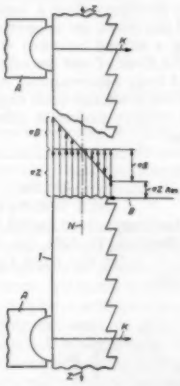
Karl Hauser, Rebstrasse 10, 8302 Augwil, Switzerland

Filed Mar. 26, 1981, Ser. No. 247,985

Claims priority, application Switzerland, Mar. 27, 1980, 2402/80

Int. Cl.³ B23D *53/00*

U.S. Cl. 83—13 **21 Claims**



1. A method for controlling the cutting feed speed of band saw machines equipped with a toothed saw band to attain an optimum feed velocity with substantial constant safety against straying, comprising the steps of empirically determining under predetermined conditions an acceptable optimum cutting force representing a desired cutting force value, calculating from said acceptable optimum cutting force the corresponding residual tensile stress in the saw band, and continuously maintaining the saw band under said residual tensile stress within the critical zone of the teeth by measuring the actual value of the cutting force, comparing the actual cutting force value with the desired cutting force value, and adjusting the actual cutting force in case of differences between the actual and desired cutting force value to thereby maintain an at least approximately constant value of said residual tensile stress

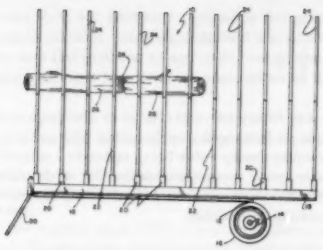
and therewith obtain substantially optimum feed velocity during cutting of the workpiece.

4,437,368

APPARATUS AND METHOD OF REDUCING TREES TO FIREWOOD

Nicholas L. Bennett, Rte. #3, Abilene, Kans. 67410

Filed May 24, 1982, Ser. No. 381,556
Int. Cl.³ B27B *1/00*
U.S. Cl. 83—13 **3 Claims**



3. A process for reducing trees to firewood comprising the steps of:

(a) placing at least one tree log upon a plurality of detachable upright yoke support means having a U-shaped top and spacedly positioned along an angle iron frame means to elevate the tree log above the ground;

(b) cutting the tree log between a predetermined pair of contiguous yoke support means, depending on the length of firewood desired, by a chain saw means;

(c) cutting additionally the tree log between at least one more predetermined pair of contiguous yoke support means by the chain saw means;

(d) removing the cut tree log of step (b) from a portion of the plurality of yoke support means;

(e) detaching the upright yoke support means which were holding the cut tree log of step (d) in order to have easier access to the additionally cut tree log of step (c); and

(f) removing the additionally cut tree log of step (c) from a remaining portion of the plurality of yoke support means.

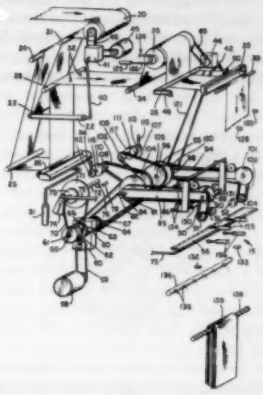
4,437,369

SHEET MATERIAL CUTTING METHOD AND APPARATUS

Charles E. Brockleburst, and Bruce H. Cooper, both of Fountain Inn, S.C., assignors to Opelika Manufacturing Corporation, Chicago, Ill.

Filed Jul. 19, 1982, Ser. No. 399,709
Int. Cl.³ D06H *7/02*
U.S. Cl. 83—18 **15 Claims**

1. A method of cutting sheet material across its length, the sheet material having bands of varying thickness extending across its length comprising the steps of advancing the material from a supply along its length through a predetermined path toward a cutting station; detecting variances in the thickness of the sheet material at opposite edge portions of the sheet material at predetermined positions ahead of the cutting station; stopping each edge portion of the sheet material independently of the other edge portion at the cutting station in response to detecting a variance in the thickness at an edge portion; pulling the sheet material at the cutting station taut across its length;



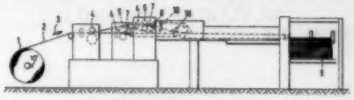
cutting across the sheet material at the cutting station while the sheet material is pulled taut.

4,437,370

METHOD FOR THE OPERATION OF A CROSS-CUTTING APPARATUS

Helmut Philipp, and Wilfried Kurth, both of Dusseldorf, Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,613
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039983
Int. Cl.³ B26D *7/00*
U.S. Cl. 83—23 **3 Claims**



1. In the cutting of a continuous web such as paper or cardboard into sheets employing a cross-cutting apparatus comprising conveyor rolls, a pair of parallel cross-knives and a sheet outfeeder, the improvement in the start-up or restarting of the apparatus which comprises moving the cross-knives to a position not interfering with the free passage of the web, starting the apparatus up by setting the conveyor rolls in rotation, and bringing the cross-knives into the cutting position only after the leading end of the web has been introduced in full web width into the sheet outfeeder.

4,437,371

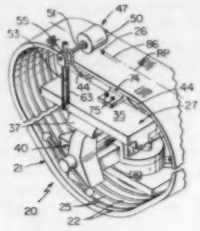
METHOD FOR CUTTING POLYMERIC BELT BODY

Anderson W. Howerton, Nixa, and Mark P. Foley, Springfield, both of Mo., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 210,991, Nov. 26, 1980, Pat. No. 4,368,656.
This application Sep. 20, 1982, Ser. No. 420,536
The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.
Int. Cl.³ B26D *3/00*
U.S. Cl. 83—54 **4 Claims**

1. In a method of cutting a polymeric endless power transmission belt body which has a plurality of endless V-belt elements fastened in spaced side-by-side relation by an endless structure to define alternating projections and grooves in said belt body, said grooves having side walls defined by facing surfaces of an immediately adjacent pair of belt elements, said method comprising the step of cutting said endless structure with a cutting knife to define a plurality of endless belts each

having at least one belt element; the improvement comprising the steps of, disposing a support in a stationary position, fastening said knife at a fixed position on said support, providing a pair of freely rotatable wheels disposed substantially in a rectilinear path with said knife and aligned therewith for supporting and guiding said belt body during cutting, disposing said knife and the outer portions of said wheels against said facing surfaces of a particular groove during said cutting step, utilizing said outer portions of said wheels as the sole means to engage said belt body to provide said supporting and guiding, rotatably supporting said wheels on said support, and moving said belt body relative to said knife in cutting engagement with said structure, said knife cooperating with said wheels during said moving step to provide precise cutting through said structure at the base of said particular groove.

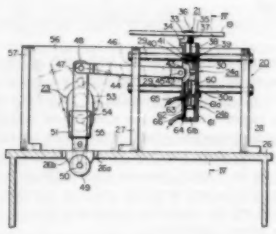


4,437,372

SHEARING MACHINE

Hideo Ishigami, Kawasaki, and Nobuo Tobei, Mishima, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,327
Claims priority, application Japan, Dec. 20, 1980, 55-181080
Int. Cl.³ B23D *25/06*; B26D *1/60*
U.S. Cl. 83—320 **4 Claims**



1. A shearing machine having a movable cutter and a fixed cutter coacting to cut off a continuously fed material into given lengths, comprising:

(a) an adjustable-speed motor, having a drive shaft, for driving the shearing machine,

(b) at least one guide rod mounted on frame means to guide the movable and fixed cutters in a direction generally parallel to the feed path of said continuously fed material;

(c) a traveling assembly reciprocable along said guide rod, said travelling assembly including:

a travelling case;

a fixed-cutter holder secured to an end of said case fixedly supporting the fixed cutter thereon;

a movable-cutter holder supporting the movable cutter on the case;

a movable axle supporting said movable-cutter holder, said movable axle being movable within said travelling case in a direction substantially perpendicular to the feed path of said material; and

a piston rod connected to said movable axle;

(d) a double-acting hydraulic cylinder connected to said piston rod to move said movable cutter in the perpendicular direction;

(e) a reciprocating mechanism for moving said travelling assembly along said guide rods at substantially the same speed as said material, said reciprocating mechanism including:

a crank lever affixed at one end to said drive shaft;

a flying slide rotatably supported at the other end of said crank lever by an axle;

a slide link slidably fitted to said flying slide, one end of said link being pivotably supported on the shearing machine; and

a connecting link rotatably connecting the other end of said slide link to said travelling assembly, rotation of said crank lever causing said slide link to oscillate and said connecting link to reciprocate to drive said travelling assembly; and

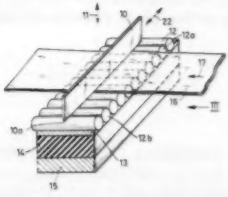
(f) a two-way rotary valve to charge or discharge a working fluid into or from said double-acting hydraulic cylinder, said two-way rotary valve being opened or closed by said adjustable-speed motor in coordination with and at substantially the same cyclical period as movement of said reciprocating mechanism.

4,437,373

ARRANGEMENT FOR PERFORATING OR CUTTING FOILS

Leonard Van Der Meulen, 17, Rue M^dBayram V, Tuni. el Menzah V, Tunisia

Filed Jul. 23, 1982, Ser. No. 401,327
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130090
Int. Cl.³ B26F *1/18*
U.S. Cl. 83—346 **21 Claims**



1. An arrangement for perforating foils, particularly of synthetic plastic material, comprising

an elongated cutter; and

a counter element, said elongated cutter and said counter element being movable relative to one another in a direction of elongation of said cutter and also toward one another, said cutter being provided over its entire length with an uninterrupted cutting edge, and said counter element being composed of a plurality of rollers movable about their axes and located adjacent to one another, so as to provide for selective perforating or cutting.

4,437,374

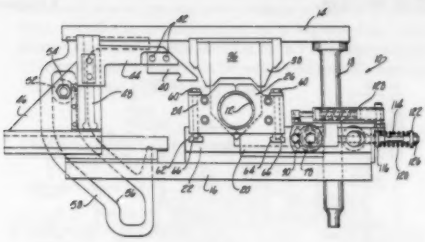
TUBE CUTTING APPARATUS

John J. Borzym, 4820 Schoolbell La., Birmingham, Mich. 48010

Division of Ser. No. 270,298, Jun. 4, 1981, Pat. No. 4,392,644, which is a continuation of Ser. No. 119,241, Feb. 7, 1980, Pat. No. 4,294,147. This application Jan. 28, 1983, Ser. No. 461,850

Int. Cl.³ B23D *21/00, 25/04*

U.S. Cl. 83—454 7 Claims



1. Apparatus for severing an elongate workpiece, comprising:

a blade for severing said workpiece;

a pair of opposed jaws for clamping said workpiece therebetween;

first and second means for respectively mounting said die jaws for reciprocating movement toward and away from each other between an open release position and a closed clamping position;

cam means coupled with said mounting means for applying a preselected value of force to said first and second mounting means whereby to cause said jaws and said mounting means to shift to said closed position thereof; and

means coupled with said cam means for limiting the magnitude of force applied by said cam means to said first and second mounting means to said preselected value thereof.

4,437,375

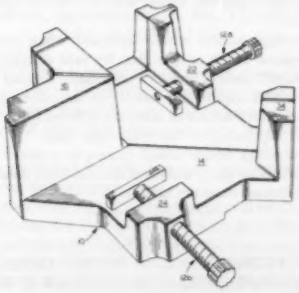
MOLDED FRAME MAKER MITRE BOX WITH CLAMPS

James Elmore, Simsbury, and Robert F. West, West Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Oct. 21, 1981, Ser. No. 313,477

Int. Cl.³ B27G *5/02*

U.S. Cl. 83—762 12 Claims



1. A mitre box especially adapted for making frame pieces comprising:

A. a support member integrally formed from synthetic resin and including a platform portion providing a generally planar upper surface, a corner post extending upwardly therefrom and having right angularly disposed vertical faces bordering said upper surface of said platform portion, clamp posts spaced to the opposite sides of said upper surface of said platform portion from said vertical faces of said corner post and extending upwardly from said platform portion, and a saw guide post extending upwardly from said upper surface of said platform portion between said clamp posts on the side thereof opposite from said corner post, said corner post having a channel therein extending transversely therethrough and downwardly thereinto from its top surface, said channel bisecting the 90° angle defined by the cooperating vertical faces of said corner post, said saw guide post having a channel extending transversely therethrough and downwardly thereinto from its top surface, said saw guide post channel being aligned with said corner post channel so that a saw blade may be guided by said channels to cut the end of a workpiece extending parallel to and abutting either one of said corner post vertical faces at substantially a 45° angle, said corner post having a second vertical channel therein spaced from said first mentioned channel and extending transversely therethrough and downwardly thereinto along a line perpendicular to one of said right angularly disposed vertical faces of said corner post, the clamp post cooperating with said one vertical face having a channel therein aligned with said second channel of each corner post, said channel of said clamp post extending transversely therethrough and downwardly thereinto from the top surfaces thereof, whereby a saw blade may be guided by said second channel of said corner post and said channel of said clamp post to cut the end of an associated workpiece extending parallel to said one vertical face at substantially a 90° angle;

B. clamp assemblies adjustably mounted in said clamp posts, each said clamp including an elongated member having its longitudinal axis extending perpendicularly to the cooperating face of said corner post and threadably engaged in its post for adjustable movement towards and away from the cooperating vertical face of said corner post, the end of said elongated member adjacent said corner post having a clamping face for engagement with the associated workpiece to hold it against the cooperating face of said corner post.

4,437,376

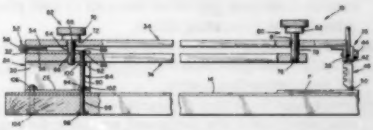
APPARATUS FOR CONTROLLING AND RELEASING PRESSURE OF A TOOL ON A WORKPIECE

David L. Flint, 4430 Asbury Dr., Toledo, Ohio 43612

Filed May 19, 1982, Ser. No. 379,651

Int. Cl.³ C03B *33/12*

U.S. Cl. 83—886 20 Claims



1. Mounting apparatus for holding a tool for forming a mark on a workpiece manipulated by hand under the tool, said apparatus comprising means forming a flat supporting surface for the workpiece, a mounting stand affixed to said surface-forming means, a release arm extending from said stand over said surface, a tool-supporting arm extending from said stand over said surface in the same direction as said release arm, tool holding means carried by said supporting arm, pressure means engagable with said supporting arm and said stand to urge the outer end of said supporting arm toward said surface, and means engagable with one of said release arm and said supporting arm and extending between said release arm and said supporting arm to enable said supporting arm to be manually moved away from said surface when it is desired to remove the

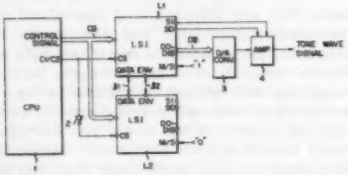
workpiece from contact with the tool held by said tool holding means of said supporting arm.

4,437,377

DIGITAL ELECTRONIC MUSICAL INSTRUMENT

Tsuyoshi Mitarai, Yokohama, and Kunio Sato, Tokyo, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1982, Ser. No. 370,088
Claims priority, application Japan, Apr. 30, 1981, 56-66220; Apr. 30, 1981, 56-66221
Int. Cl.³ G10H 1/00
U.S. Cl. 84—1.01 10 Claims



1. A digital electronic musical instrument comprising:
a plurality of musical tone generating means, each musical tone generating means generating digitized musical tone data representing a plurality of musical tones;
composing means for digitally composing said digitized musical tone data generated from all of said plurality of musical tone generating means;
operating means coupled to said composing means for selectively compressing or expanding the composed musical tone data in accordance with the composed musical tone data from all of said musical tone generating means; and
output means including digital to analog converting means coupled to said operating means for converting the composed expanded or compressed musical tone data into an analog signal corresponding to a musical sound.

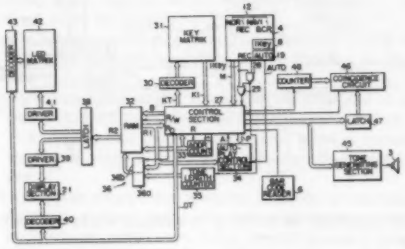
5. A digital electronic musical instrument comprising:
a plurality of musical tone generating means, each musical tone generating means including means for generating digitized musical tone data and digital envelope data, the digitized musical tone data being envelope-controlled in accordance with said digital envelope data;
first composing means for digitally composing said digitized musical tone data generated from all of said plurality of musical tone generating means;
second composing means for digitally composing said digital envelope data generated from all of said plurality of musical tone generating means;
setting means for setting compressing or expanding levels in accordance with the composed envelope data produced from said second composing means;
operating means for compressing or expanding the composed musical tone data from said first composing means in accordance with said compressing or expanding level set by said setting means;
digital to analog converting means;
means for supplying the compressed or expanded digitized musical tone data output from said operating means to said digital to analog converting means; and
amplifying means for amplifying an output signal from said digital to analog converting means as a function of said compressing or expanding level set by said setting means to thereby effect compression or expansion of said output signal.

4,437,378

ELECTRONIC MUSICAL INSTRUMENT

Hideaki Ishida, Tokyo; Tomohisa Ishikawa, Kawagoe; Koji Yamana, and Takehiko Kayahara, both of Tokyo, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,474
Claims priority, application Japan, Mar. 30, 1981, 56-45631; Mar. 30, 1981, 56-45632; Mar. 30, 1981, 56-45633
Int. Cl.³ G10H 3/06
U.S. Cl. 84—1.18 5 Claims



1. An electronic musical instrument comprising:
a plurality of performance keys,
a bar code reader for reading bar code data from a recording medium on which predetermined tone data including at least pitch data and duration data are printed in the form of bar codes,
memory means for digitally storing pitch data corresponding at least to the bar code data read out by said bar code reader,
selection means for specifying first and second performance modes,
first control means which operates when said first performance mode is specified by said selection means, said first control means comprising a plurality of display members each arranged to indicate a different one of the performance keys,
first read out means responsive to operation of the performance key indicated by the associated display member, for reading out from said memory means pitch information corresponding to the next pitch to be played,
display control means operative to discriminate from other display members, the display member of that performance key which corresponds to the pitch information read out by said first read out means and to activate said display member,
second control means which operates when said second performance mode is specified by said selecting means, said second control means comprising second read out means which sequentially reads out the pitch data stored in said memory means in intervals following the duration data corresponding to the pitch data, and
sound generating means which generates a sound in accordance with the pitch data and the duration data read out by said second read out means.

4,437,379

ELECTRONIC MUSICAL INSTRUMENT OF WAVEFORM MEMORY READOUT TYPE

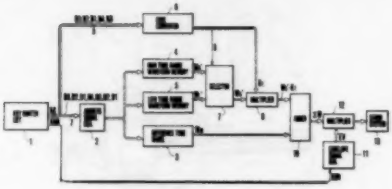
Takatoshi Okumura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 26, 1981, Ser. No. 315,110
Claims priority, application Japan, Nov. 29, 1980, 55-168442
Int. Cl.³ G10H 1/06
U.S. Cl. 84—1.22 3 Claims

1. An electronic musical instrument comprising:
keyboard means having a plurality of keys which are divided

into a plurality of tone ranges, each of said tone ranges including one or more adjacent keys respectively;

memory means for storing at least two waveforms of a number smaller than the number of said tone ranges, one of said stored waveforms being a reference waveform which is a musical tone waveform corresponding to a specific one among said tone ranges and a second of said at least two stored waveforms being a difference waveform whose waveshape is the difference between said reference waveform and a waveform which is a musical tone waveform corresponding to a highest tone range among said tone ranges divided by a factor proportional to the numerical difference between said specific one tone range and said highest tone range;



address signal generating means for generating an address signal having a repetition period corresponding to a tone pitch of a depressed key and for supplying said address signal to said memory means so that said reference waveform and said difference waveform respectively having the periods equal to said repetition period are read out from said memory means;

coefficient generator means for producing a coefficient having a value proportional to the numerical difference between said specific one tone range and the tone range corresponding to said depressed key;

multiplier means for multiplying said difference waveform by said coefficient to generate a modified waveform; and

means for adding said modified waveform to said reference waveform to produce a musical tone waveform corresponding to said depressed key.

4,437,380

MUSICAL ENVELOPE-PRODUCING DEVICE

Tetsuo Yamaguchi, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 15, 1981, Ser. No. 331,077

Claims priority, application Japan, Dec. 17, 1980, 55-178424

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.26 **10 Claims**

1. A musical envelope-producing device comprising:

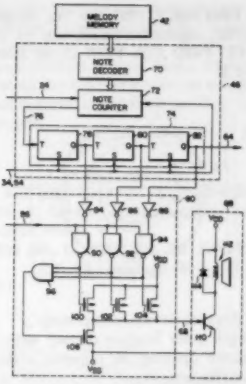
(a) memory means for storing a plurality of note data including first musical performance data representing note pitch and second musical performance data representing note duration;

(b) read-out means for selecting and reading out the note data from said memory means;

(c) first processing means, connected to said memory means, for receiving the first musical performance data and generating a tone signal according to the first musical performance data;

(d) second processing means, connected to said memory means, for receiving the second musical performance data and dividing the note duration represented by the second musical performance data into a plurality of time components represented by division signals, said division signals comprising a plurality of signals of different periods; and

(e) envelope circuit means, responsive to said tone signal and said division signals, for producing a stepped, sound pressure signal representing a stepped musical envelope waveform whose level attenuates during note duration in a stepped manner in response to said division signals,



whereby said sound pressure signal and said tone signal are used to generate a sound signal.

4,437,381

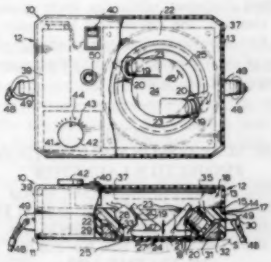
METRONOMIC SIGNALLING DEVICES AND METHOD OF TEMPO SIGNALLING

Shin H. Chen, 1725 N. LeClaire Ave., Chicago, Ill. 60639

Filed Jul. 21, 1982, Ser. No. 400,378

Int. Cl.³ G10B *15/00*

U.S. Cl. 84—484 **15 Claims**



1. A silent metronomic pulsing device, comprising:

a housing having an opening;

a soundproof relatively soft, yieldably movable transmission pad fixed across said opening and having a texture accentuated face projecting outwardly from said housing for tempo-signal-imparting engagement with a user, and a surface of substantial area facing inwardly into said housing;

transducer means comprising a disk-like member fixed to and movable with said inwardly facing surface of the soundproof pad and covering a major portion of said area;

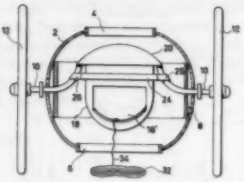
dynamoelectric means carried in part fixedly on said member and in part fixedly on said housing and operable for pulsing said member and thereby actuating said pad for tempo signal transmission to the user without acoustical interference;

and electrical means for operating said pulsing means and including means for selectively controlling the pulsing tempo of the pulsing means.

4,437,382
BOMB DISPOSAL DEVICE

Yaakov Yerushalmi, Rechov Hapartisanim 3, Petach Tikva, Israel

Filed Sep. 9, 1981, Ser. No. 300,897
Claims priority, application Israel, Sep. 14, 1980, 61035
Int. Cl.³ F42D *5/04;* **F24B** *33/06;* **E06B** *9/00*
U.S. Cl. 86—1 B **10 Claims**

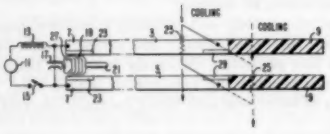


1. A bomb disposal device, comprising:
a high-strength outer housing formed with a first opening and a second opening on opposite sides thereof, both leading into its interior;
pivotal mounting means for said outer housing to permit pivoting same about a horizontal axis from an upright position wherein said first and second openings are in substantial vertical alignment, to a horizontal position wherein they are in substantial horizontal alignment;
an inner, open-ended container within said housing and fixed with respect to said mounting means such that the container's open end is disposed upwardly and underlies said housing first opening in the upright position of the housing;
and a cover within said housing and fixed with respect to said mounting means to overlie the open end of the container;
said cover being of larger dimensions than said housing first opening such that in the event of explosion of a bomb within said container while the outer housing is in its upright position, the cover will be blown against said housing first opening to close same and thereafter to direct the force of the explosion vertically downwardly through the housing second opening.

4,437,383
MUZZLE ARC SUPPRESSOR FOR ELECTROMAGNETIC PROJECTILE LAUNCHER

Daniel W. Deis, Churchill Borough, and George A. Kemeny, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 8, 1981, Ser. No. 309,861
Int. Cl.³ F41F *1/00*
U.S. Cl. 89—8 **17 Claims**

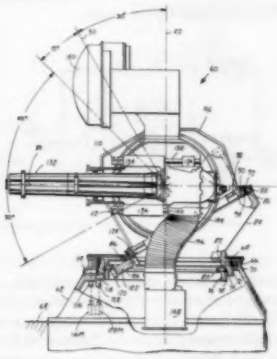


1. An electromagnetic projectile launcher comprising:
a pair of generally parallel conductors having a breech and a muzzle end;
means for conducting current between said conductors and for accelerating said projectile;
a source of high current connected to said conductors;
a first impedance disposed across said conductors adjacent the muzzle end thereof;
a second impedance disposed in at least one of said conductors on the muzzle side of where said first impedance is connected across said conductors;
whereby current is commutated to said first impedance to suppress muzzle arcing.

4,437,384
GUN MOUNT

Douglas P. Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Aug. 17, 1981, Ser. No. 293,716
Int. Cl.³ F41F *21/04*
U.S. Cl. 89—37 A **7 Claims**



1. A mount, for an apparatus having a longitudinal axis, having three axes of rotation with respect to a reference plane comprising:
a zenith axis which is perpendicular to said reference plane,
a train axis which is perpendicular to a tilted plane which is at an angle to said reference plane,
an elevation axis which is parallel to said tilted plane,
said mount including:
a support which is parallel to said reference plane;
a base which is journaled to said support for rotation about said zenith axis;
a train ring which is journaled to said base in a plane which is parallel to said tilted plane for rotation about said train axis;
an elevation ring which is journaled to said train ring in a plane which is perpendicular to said tilted plane for rotation about said elevation axis;
first drive means fixed to said support and coupled to said base for orienting said base about said zenith axis; and
second drive means fixed to said support and coupled to said train ring for orienting said train ring about said train axis;
said first and second drive means being independently and concurrently operable to independently and concurrently drive said base and said train ring respectively.

4,437,385
ELECTROHYDRAULIC VALVE SYSTEM

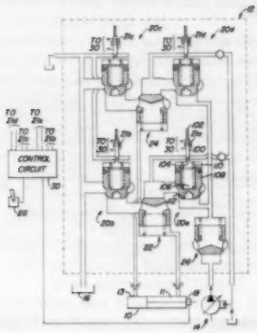
Kenneth D. Kramer, and Edward H. Fletcher, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 1, 1982, Ser. No. 364,373
Int. Cl.³ F15B *13/16*
U.S. Cl. 91—361 **20 Claims**

1. A system for controlling a double-acting hydraulic cylinder having extension and retraction chambers separated by a piston in the cylinder, comprising:
a valve assembly comprising a first pilot-operated proportional-type poppet valve for controlling fluid communication between pump and the retraction chamber, a second

pilot-operated proportional-type poppet valve for controlling fluid communication between the retraction chamber and a reservoir, a third pilot-operated proportional-type poppet valve for controlling fluid communication between the extension chamber and the reservoir and a fourth pilot-operated proportional-type poppet valve for controlling fluid communication between the pump and the extension chamber;

a plurality of solenoid-operated pilot valves, each pilot valve operating one of the poppet valves;



position-sensing means for sensing the position of the cylinder and for generating a feedback signal indicative thereof;

operator-controlled means for generating a command signal representing a desired position of the piston relative to the cylinder; and

control circuit means for generating an error signal derived from the feedback and command signals and for energizing selected ones of the pilot valves to operate corresponding ones of the poppet valves to move the cylinder and reduce the magnitude of the error signal.

4,437,386

PNEUMATICALLY OPERATED SERVO-MOTOR AND CONTROL METHOD THEREFOR

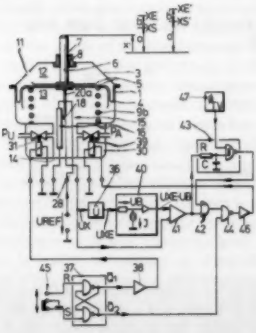
Hans Baumgartner, Viersen, Fed. Rep. of Germany, assignor to Pierburg GmbH & Co., KG, Neuss, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,301

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128486

Int. Cl.³ F15B *9/03*

U.S. Cl. 91—363 R **11 Claims**



1. A method of controlling a pneumatically operated servomotor having an operating rod with a substantially linear stroke and a pneumatic chamber for actuating said operating rod according the pressure in said chamber, said method comprising the steps of continuously monitoring the actual position of said operating rod during each stroke thereof, recording a limit position reached by said operating rod in each stroke, and modifying the speed at which said operating rod travels towards said limit position of said stroke during each stroke when said operating rod reaches a position which lies a predetermined amount in front of said limit position reached during the preceding stroke.

4,437,387

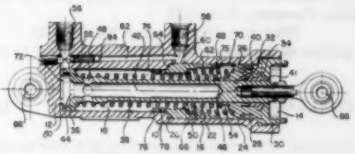
INTEGRAL ACTUATOR AND SEQUENCING VALVE

Robert L. R. Beck, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 15, 1981, Ser. No. 225,252

Int. Cl.³ F15B *15/22*

U.S. Cl. 91—401 **7 Claims**



1. An integral actuator and sequencing valve, comprising:

an elongated housing including first and second end walls and sidewall means defining a chamber within said housing having a first diameter portion which extends axially inwardly of the housing from the first end wall to a mid-portion of the chamber, a second and larger diameter portion extending axially inwardly of the housing from the second end wall of the chamber to such mid-portion of the chamber, and a shoulder at the mid-portion of the chamber where the two different diameter portions of the chamber meet;

a piston within said chamber having a piston head adapted to slide within the first diameter portion of said chamber, a piston rod connected to the piston head and extending therefrom through the chamber and out through an opening in the second end of the housing, and passageway means in the piston communicating one side of the piston head with the other;

an inlet port communicating with said chamber closely adjacent the first end wall of the housing and a radial outlet port communicating with the chamber at a location axially between said shoulder and the second end wall of the housing;

passageway means communicating a portion of the outlet port that is located outside of the chamber with a portion of the inlet port which is located outside of such chamber, said passageway means including check valve means permitting flow from the outlet port to the inlet port and preventing flow through said passageway means from the inlet port to the outlet port, and said passageway means extending generally axially through the sidewall means of the housing;

a sleeve slidably received within the larger diameter portion of the chamber, said sleeve including a shoulder contacting inner end portion and a sidewall closure portion which extends across and blocks the outlet port when the sleeve is against the shoulder, and an inner end portion which is in the travel path of the piston head;

a sleeve biasing spring positioned to bias the sleeve towards and into contact with the shoulder; and

a piston return spring positioned to bias the piston into a retracted position adjacent the first end wall;

wherein the piston head, the closure sleeve, and the chamber are dimensioned such that when the piston is retracted and

pressure fluid is introduced into the chamber through the inlet port, such fluid will move the piston through the chamber until the piston head makes contact with the portion of the sleeve which is in the travel path of the piston head, and then further introduction of fluid will move both the piston and the sleeve together, until the piston has reached the end of its stroke and is fully extended; and

wherein the closure portion of the sleeve is positioned away from the outlet port when the piston is fully extended and the outlet port is in fluid receiving communication with the piston rod side of the piston head, whereby fluid communication is established through the chamber, from the inlet port to the outlet port.

4,437,388

DUAL INPUT PRESSURE COMPENSATED FLUID CONTROL VALVE

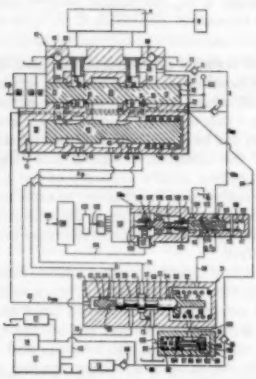
Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Aug. 20, 1981, Ser. No. 294,605

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.³ F15B *13/04*

U.S. Cl. 91—446 **16 Claims**



13. A dual input valve assembly operable to control fluid flow to and from a fluid motor subjected to an opposing or aiding load, said valve assembly having first valve means operable to provide first and second control orifice means to meter fluid flow to and from said fluid motor, throttling control means operable to selectively throttle fluid flow to and from said fluid motor, single pilot means having means responsive to pressure differential across said first and said second orifice means and operable through said throttling control means to maintain a relatively constant pressure differential at a preselected constant level across said single pilot valve means and to maintain a constant pressure differential across said first and said second control orifice means during control of said opposing or said aiding load, first pressure signal transmitting means operable to transmit control pressure signal from down stream of said first control orifice means to controller means, second pressure signal transmitting means operable to transmit control pressure signal from down stream of said second control orifice means to said controller means, said controller means having means responsive to an electrical pulse type signal and means operable to modify said pressure signal transmitted from said first and said second signal transmitting means, whereby the level of said constant pressure differential acting across said first and second control orifice means can be varied with respect to said electrical pulse type signal while said pressure differential across said single pilot valve means remains constant at said constant predetermined level.

4,437,389

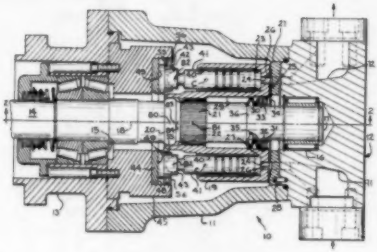
AXIAL PISTON PUMP HAVING BARREL BIASING MEANS

William L. Kline, Galena, Ohio, assignor to The Kline Manufacturing Company, Galena, Ohio

Filed Feb. 10, 1982, Ser. No. 347,511

Int. Cl.³ F01B *13/00*

U.S. Cl. 91—499 **9 Claims**



1. A fluid energy translating device including a housing having inlet and outlet passages, a port plate mounted in said housing and having inlet and outlet ports communicating with said inlet and outlet passages in said housing, a rotatable cylinder barrel abutting said port plate, having an axis of rotation perpendicular to said port plate and defining a centrally disposed through bore and a plurality of cylinders arranged about such axis of rotation, each cylinder having an axis spaced from and parallel to such axis of rotation, a piston in each cylinder, cam means for reciprocating said pistons as said barrel rotates, a drive shaft extending coaxially through said barrel and rotatably supported in said housing, means for rotatably coupling said barrel and said drive shaft, compression spring means operably disposed between said barrel and said drive shaft for providing a substantially constant force biasing said barrel against said port plate notwithstanding axial movement of said barrel over a limited distance and means for adjusting such biasing force.

4,437,390

POWER-SERVO BOOSTER

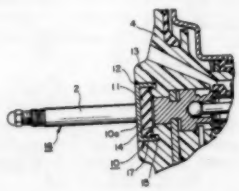
Ryuji Ohta, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,438

Claims priority, application Japan, Jul. 25, 1980, 55-105316[U]

Int. Cl.³ F16J *1/10*; F15B *9/10*

U.S. Cl. 92—84 **4 Claims**



1. In a power-servo booster wherein a fitting member provided at the end of a push rod is slidably fitted in a connection hole in a power piston and reaction force which acts on the push rod is transmitted to an input shaft via a reaction disk, the improvement wherein:

said fitting member is made cylindrical and cup-shaped and

has a closed disk-shaped bottom over an entire cross-section of said fitting member in a plane extending through a central axis of said fitting member;

said reaction disk is disposed within said cylindrical fitting member;

an entire outer cylindrical surface of said reaction disk is completely surrounded by an inner cylindrical surface of said fitting member;

an annular groove is formed in an outer periphery at the bottom of said connection hole in said power piston;

a portion of said power piston within said annular groove projects toward said push rod;

said fitting member in which said reaction disk is disposed is fitted into said connection hole so that said reaction disk can contact with an end surface of the projecting portion of said power piston and a peripheral end of said fitting member can fit into said annular groove; and

an annular gap is formed between said fitting member and the bottom of said annular groove to allow for deformation of said reaction disk.

4,437,391

AIR CONDITION CONTROL APPARATUS WITH INDOOR AND OUTDOOR AIR SELECTION MODES FOR AUTOMOBILES

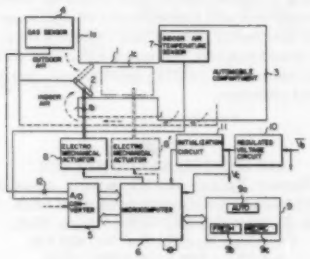
Osamu Eguchi, Anjo, and Tomonori Fukui, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 1, 1981, Ser. No. 326,414

Claims priority, application Japan, Dec. 2, 1980, 55-170716

Int. Cl.³ B60H *1/00, 3/00*

U.S. Cl. 98—2.01 **5 Claims**



1. An air-condition control apparatus for an automobile including an air conditioning unit in which the upstream side is selectively communicated to the outside or inside of the automobile compartment and the downstream side is communicated to the inside of the automobile compartment, an actuator for selectively taking in air from the outside of the compartment and from the inside of the compartment in said air conditioning unit, and a detector for generating an analog electrical signal in accordance with impurity components of air taken in from the outside of the compartment, wherein said air condition unit further comprises a control means for controlling said actuator in accordance with the electrical signal generated from said detector, said control means for producing a reference level from the minimum value of the detector output during the period of time when the detector is energized to the time when the detector is deenergized and comparing an output of said detector with said reference level, thereby fixing said actuator to a state of intaking air from the inside of the compartment when the compared differential value exceeds a first predetermined value and returning the actuator to a state of intaking air from the outside of the compartment when the compared differential value becomes smaller than a second predetemined value, the second predetermined value being set to be smaller than the first predetermined value.

4,437,392

SWEEPING AIR STREAM APPARATUS AND METHOD

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

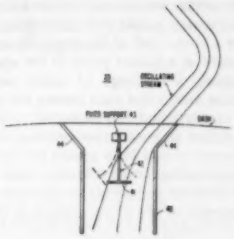
PCT No. PCT/US80/00368, § 371 Date Dec. 17, 1980, § 102(e) Date Dec. 15, 1980, PCT Pub. No. WO80/02262, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 9, 1980, Ser. No. 220,068

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.³ B60H *1/24*

U.S. Cl. 98—2.08 **22 Claims**



1. In an air flow system having a source of air under pressure flowing through a channel coupled to an outlet element and the air is issued to the ambient environment in a sweeping air stream pattern, the improvement comprising an air powered oscillatory member, said oscillatory member being a vane having a longitudinal axis normally aligned with the direction of air flow through said channel, and means securing the downstream end only of said oscillatory member in fixed relation to said outlet element with the upstream end of said oscillatory member being free and oscillatable, solely by air flow, between a pair of extreme positions to each side of said longitudinal axis, said extreme positions being short of contacting said outlet and said channel and causing the air to issue in a sweeping air stream pattern from said outlet element.

4,437,393

ASSEMBLY COMPARTMENT ARRANGED BETWEEN AN ENGINE COMPARTMENT OR TRUNK AND A SPLASH PANEL OF A MOTOR VEHICLE

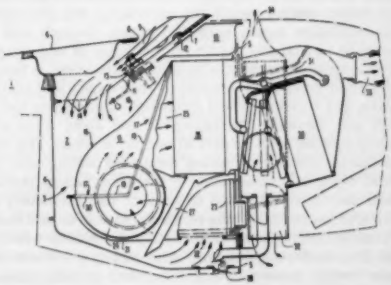
Albert Stolz, Tübingen, and Manfred Mordau, Sindelfingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,175

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023236

Int. Cl.³ B60H *1/28*

U.S. Cl. 98—2,17 **17 Claims**



1. An assembly compartment for a heating/ventilating and-

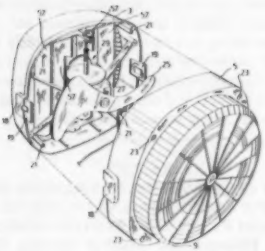
/or air conditioning system arranged between an engine compartment or trunk and a splash panel of a motor vehicle comprising an air inlet slot means for enabling a supply of fresh air into the compartment; aggregate means accommodated in the compartment for affecting air deflecting and air distributing of the supply of fresh air into an interior space of the vehicle; jacket means accommodating at least a portion of the aggregate means are provided for enhancing separation, deflection, and conducting of water extracted from the fresh air; means are arranged on an underside of the aggregate means for directing a flow of the supply of fresh air from the assembly compartment to the interior space of the vehicle in an upwardly oriented direction; an area forward of the splash panel for at least one of a filter means and an evaporator for an air conditioning means; duct means in said area for feeding water accumulated therein to a lower end of the assembly compartment; water drainage means at a lowest point of the assembly compartment for enabling a drainage of water separated and drained by the jacket means and duct means; the jacket means having a divided construction and including a lid means removable so as to define an installation opening for the jacket means to permit access to said filter means and/or said evaporator for an air conditioning means whereby water is extracted from the supply of fresh air and access to said area of the jacket means from the exterior of the motor vehicle is facilitated.

4,437,394

DIRECTIONAL AIR FLOW FAN

Arthur K. Tateishi, 25 Warrender, Apt. 202, Toronto, Ontario, Canada

Filed Aug. 3, 1981, Ser. No. 289,778
Int. Cl.³ F24F *13/16*
U.S. Cl. 98—40 V **18 Claims**



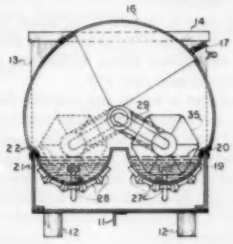
1. A fan structure having a housing, a fan blade rotatable within said housing, a plurality of vanes adapted to oscillate relative to said housing, oscillation means for oscillating said vanes, a drive system for driving said oscillation means, a motor for operating said drive system and said fan blade, a motor control switch and a control mechanism independent of said motor control switch for connecting and disconnecting said oscillation means with said motor through said drive system to turn on and to turn off oscillation of said vanes, said drive system comprising a rotating drive wheel, a longitudinally fixed drive shaft adapted to reciprocate said oscillation means, and a pickup wheel rotationally coupled to said drive shaft and moveable therealong to and away from a drive pickup position with respect to said drive wheel, said control mechanism comprising spring means for sliding said pickup wheel along said drive shaft to the drive pickup position to rotate said drive shaft and to connect said oscillation means with said motor for turning on the oscillation of said vanes, an adjustable control member for sliding said pickup wheel along said drive shaft away from said drive pickup position to discontinue further rotation of said drive shaft and disconnect said oscillation means from said motor for turning off the oscillation of said vanes, and a lock position for releasably locking said pickup wheel away from said drive pickup position.

4,437,395

SPAGHETTI AND FOOD COOKER

Richard L. Speaker, 113 E. Brentwood Rd., Greensboro, N.C. 27403

Filed Apr. 2, 1982, Ser. No. 364,900
Int. Cl.³ A47J *27/10*
U.S. Cl. 99—355 **10 Claims**



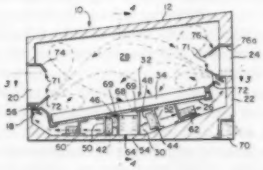
1. A spaghetti and food cooker comprising; a first chamber and a second chamber in side by side juxtaposition to each other for retaining a fluid in each chamber, means for controlled heating the fluid in each chamber, and an elongated perforated food-retaining compartment having means for loading and unloading spaghetti or food into and out of said compartment, a pair of brackets longitudinally spaced from each other and pivotally mounted above said chambers, said brackets each having distal ends, said distal ends of said brackets having compartment-retaining means thereon for securing said food-retaining compartment thereon, means for pivoting said pair of brackets with said food-retaining compartment secured thereon into and out of each of said chambers by oscillatory movement of said brackets, and means associated with at least one of said brackets for rotating said compartment while retained in said chambers.

4,437,396

AIR HEATED SANDWICH BIN

Robert F. Plattner, Spring Lake; Raymond J. Arend, and John A. VerBerkmoes, both of Grand Haven, all of Mich., assignors to Bastian Blessing Co., Inc., Grand Haven, Mich.

Filed Sep. 28, 1982, Ser. No. 425,430
Int. Cl.³ A23B *4/04;* B65G *55/00*
U.S. Cl. 99—475 **20 Claims**



1. A heated, moist air sandwich bin for maintaining sandwiches therewithin sufficiently moist and at pre-selected elevated temperatures comprising:

a housing, said housing including a front wall, a rear wall, a top, a pair of opposite side walls and a floor, said front wall defining an open front service opening substantially across the width of the bin through which sandwiches may be inserted and withdrawn;

sandwich support means for storing sandwiches within said bin above said floor and below said service opening for easy access to the sandwiches through said service opening, said floor dividing said bin into an upper sandwich storage compartment and a lower compartment and defin-

ing with said side walls air flow passages for permitting heated, moist air in said upper compartment to flow into said lower compartment;

blower means in said lower compartment, air humidifier means in said lower compartment upstream of said blower means, air discharge nozzle means extending substantially across the width of and below said service opening for discharging a humidified air stream across said service opening into said upper compartment, duct means communicating said blower means with said air discharge nozzle means and air heater means in said duct means for heating the air to be discharged through said nozzle means, whereby said blower means forces air in said lower compartment through said duct means, across said air heater means and through said nozzle means into said upper compartment; and

air directing means for creating a dome of moist heated air over the sandwiches in the bin positioned at said service opening and including air deflecting means located downstream of said air discharge nozzle means and extending into said upper compartment to intercept air discharging from said discharge nozzle means and to direct the flow of heated air discharging said nozzle means away from said service opening and into the housing to create and maintain said dome of heated moist air over the sandwiches in the bin while further creating turbulent zones of heated, moist air outside the dome for minimizing heated, moist air escape through said service opening.

4,437,397

AUTOMATIC PICKLE INJECTING APPARATUS

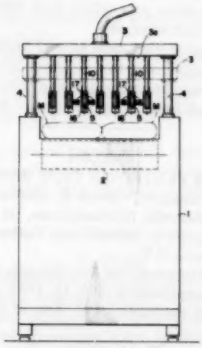
Keiichi Kawai, Amagasakishi, Japan, assignor to Futaba Denki Kogyo Kabushiki Kaisha, Osakashi, Japan

Filed Apr. 2, 1982, Ser. No. 365,087

Claims priority, application Japan, Apr. 2, 1981, 56-50195; Jan. 25, 1982, 57-10491

Int. Cl.³ A23B *4/02*

U.S. Cl. 99—533 **10 Claims**



1. An automatic pickle injecting apparatus for supplying meat with a pickle, the apparatus comprising:

a vertically movable tank adapted to contain said pickle;

said tank being transversely disposed with respect to a feeding path of said meat;

a plurality of needle means for enabling an injection of said pickle into the meat, each of said needle means having a first end adapted to be connected to the tank, a terminating end, and a passageway opening into the tank for permitting said pickle in said tank to pass therethrough, said passageway communicating with at least one opening provided at the terminating end of each of said needle means;

a plurality of sleeve means mounted on said tank and respectively surrounding at least a portion of an axial length of the respective needle means for enabling a suspension of the needle means from the bottom of the tank;

a cylindrical guide means displacably mounted on each of said sleeve means for guiding the respective needle means into the meat, said cylindrical guide means including a first end portion and a free end portion;

a valve means disposed at the free end portion of said guide means, said valve means being movable along the axial length of the respective needle means between an upper and lower position so as to close and open said at least one opening such that when said valve means is at a lowermost position, it closes said at least one opening, thereby permitting no pickle to be discharged therethrough; and

a valve holding means for urging said valve means to stay at the valve closing position.

4,437,398

ROTATING-DRUM MACHINE FOR PEELING TOMATOES

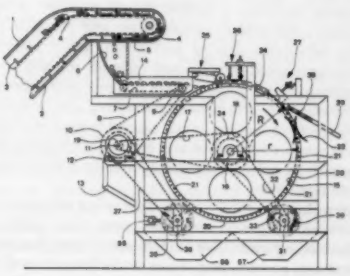
Antonio Savi, Parma, Italy, assignor to Officine Meccaniche Savi Antonio S.p.A., Parma, Italy

Filed Jul. 8, 1982, Ser. No. 396,453

Claims priority, application Italy, Sep. 18, 1981, 29073/81[U]

Int. Cl.³ A23N *7/00*

U.S. Cl. 99—587 **6 Claims**



1. A rotating-drum machine for peeling tomatoes or the like, comprising: a rotating drum including twin-cheeked channels defined by a movable cheek and a fixed cheek disposed peripherally about said drum; means for conveying unpeeled tomatoes into the channels; a cutter device having a revolving serrated tracer-wheel mounted to perforate skins of said tomatoes; cam means for gradually drawing said cheeks together to gently and gradually squeeze and separate pulp from the perforated skin, the cam means working in opposition to a magnet means for holding the cheeks apart, the magnet means being located between an outer surface of said drum and an outer surface of the movable channel-cheek, wherein said movable channel-cheek is mounted to oscillate during contact with the cam means and includes a roller on an outer face thereof; a deflector device mounted to contact the roller subsequent to ejection of the peeled tomato from the channels and discharge thereof down an exit-chute, said deflector fixedly located to move said roller from a position concurrent with one circumference imposed by radius R to a position concurrent with that imposed by smaller radius r, thereby opening the movable channel-cheek; the magnet means affixed to the outer surface of said rotating drum for retaining the movable cheek in open position.

4,437,399

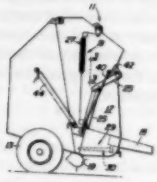
TWINE-WRAPPING MECHANISM FOR MECHANISM FOR A LARGE ROUND BALER

Richard W. Koning, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 28, 1982, Ser. No. 382,890

Int. Cl.³ B30B *13/18*

U.S. Cl. 100—4 **7 Claims**



1. In an automatic twine wrapping mechanism for a cylindrical baler having a bale forming chamber, said mechanism comprising:

a twine-dispensing mechanism for dispensing twine into the bale forming chamber of said baler for wrapping around a bale being formed therein, said dispensing mechanism including a twine arm movable back and forth in front of the bale forming chamber between first and second positions,

hydraulic drive means for cycling said twine arm back and forth in front of said bale forming chamber, said drive means including a double acting cylinder, a hydraulic pump connected to said cylinder, and pump drive means for selectively driving said pump, and a control valve interconnected between said cylinder and said pump, said valve having a valve control arm movable between a first valve control arm position permitting said twine arm to be driven from the first to said second twine arm position and a second valve control arm position permitting said twine arm to be driven from said second to said first twine arm position, and

a control means (1) for initiating a twine wrapping cycle by automatically actuating said pump drive means and by positioning said valve control arm in said first valve control arm position responsive to the formation of bale of a predetermined diameter in said chamber, and (2) for deactivating said hydraulic drive means following wrapping of twine around said bale, said control means including (1) a drive control linkage having an engaged position for engaging said pump drive and a disengaged position for disengaging said pump drive, (2) means for biasing said drive control linkage into said engaged position, (3) a latch for locking said drive control linkage in said disengaged position, and (4) a bale size linkage movable responsive to the change in diameter of a bale in said chamber between a first position corresponding to when the bale chamber is empty or when a bale has a diameter less than a predetermined value and second position corresponding to when a bale in the chamber has a diameter greater than a predetermined value;

the improvement comprising:

said control means including a latch control linkage connecting said bale size linkage and said latch and having a plurality of settings for determining the bale diameter, in excess of said predetermined value, at which said latch is unlocked, and

a manual control linkage remotely actuable from operator's station for said baler and connected to said latch for unlocking said latch and for positioning said value control arm in said first value control arm position.

4,437,400

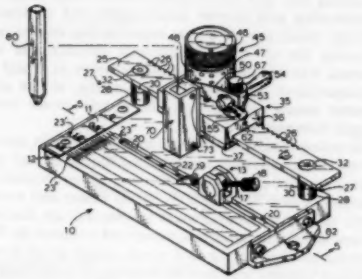
STAMPING DEVICE

Charles W. Ellis, 2371 Beach St., Bellmore, N.Y. 11710

Continuation of Ser. No. 219,019, Dec. 22, 1980, abandoned. This application Nov. 26, 1982, Ser. No. 444,737

Int. Cl.³ B41J *1/02, 3/40, 19/18*

U.S. Cl. 101—18 **11 Claims**



1. A stamping device for a workpiece, the combination comprising:

a baseplate having a top surface;

a slide rigidly coupled to said baseplate top surface and space therefrom, said slide having a ratchet-like edge;

a carriage slidably coupled to said slide and supporting a punch holder, said punch holder having a longitudinal axis substantially perpendicular to said top surface and adapted to receive a punch therein for stamping the workpiece;

indexing means, coupled to said carriage and slide, for moving said carriage in predetermined increments longitudinally relative to said slide and baseplate to selectively position said punch holder over the workpiece, said indexing means including a manually-operated, rotatable knob coupled to a drive gear which is in turn coupled to said slide ratchet-like edge, and

means for coupling said slide to said baseplate in first and second positions, said first position locating said punch holder over said baseplate and said second position locating said punch holder past an edge of said baseplate.

4,437,401

SEPARATOR PLATE FOR TYPE BAND PRINTER

Horst Heinrich, Stuttgart; Günter R. Herrmann, Sindelfingen, and Manfred Schmidt, Deckenpfronn, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 362,424, Mar. 26, 1982, abandoned. This application Aug. 11, 1983, Ser. No. 522,249

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116127

Int. Cl.³ B41J *1/20*

U.S. Cl. 101—93.14 **3 Claims**

1. A type band printer for printing characters on a print line comprising:

an endless type band;

a platen contiguous with said endless type band for guiding said endless band;

a plurality of type elements affixed to said endless type band and lying in the same plane as said print line;

means for moving said endless type band in a direction parallel to the print line;

print paper;

means for feeding said print paper;

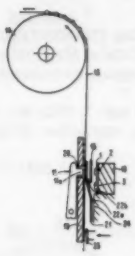
an inked ribbon located between said paper and said endless type band in the same plane as said plurality of type elements;

means for feeding said inked ribbon parallel to said endless type band;

a hammer plate, located on the opposite side of said inked ribbon from said endless type band and said platen, having an opening therein located in the same plane as said plurality of type elements;

a print hammer head capable of being thrust through said opening in said hammer plate so as to drive said print paper and said ribbon onto one of said plurality of type elements; and

an elastic separator plate, composed of polyester foil between 0.2 mm and 0.5 mm thick, located between said print paper and said inked ribbon for preventing said inked ribbon from contacting said print paper during those times when either the inked ribbon or the print paper is being fed, by exerting a force caused by its inherent elasticity on said print paper in a direction away from said inked ribbon



and said platen, and toward said hammer plate, said elastic separator plate comprising,

a longitudinal fold line substantially coextensive with the bottom of said print line for maintaining said print paper against said hammer plate across the entire width of said print paper,

an upper edge substantially coextensive with the bottom of said print line,

side arms located at the ends of said upper edge, said side arms interposed between said print paper and said ribbon for preventing said print paper

from contacting said ribbon in the areas of said side arms, and

an opening located between said side arms and bounded by said upper edge, whereby said print hammer head is thrust through said opening in said elastic separator plate.

4,437,402

ROTARY PRINTING MACHINE SYSTEM WITH OPTIONAL CONTINUOUS WEB PRINTING

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,883

Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117663

Int. Cl.³ B41F *5/16*

U.S. Cl. 101—181 **14 Claims**

1. Rotary web printing machine system, for printing on a substrate web (40) having

first and second plate cylinders (3, 4; 50; 51; 94–102–104; 95–103–105; 121–124; 129–132),

in which the second plate cylinder is located downstream—in the direction of movement of the web through the machine system—of the first plate cylinder,

each plate cylinder having a clamping groove (5, 6) parallel to the axis of rotation of the plate cylinder to receive a printing plate thereon, the printing plate in a zone adjacent the groove defining a beginning, or starting printing line (41, 42),

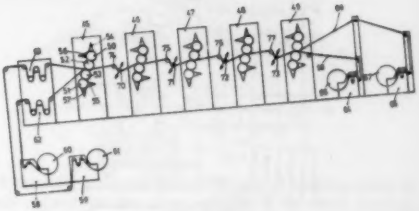
printing by the plate on the respective cylinder being interrupted at the groove resulting in gaps of printed subject matter, parallel to the axis of rotation of the plate cylinder, and being printed by the respective plate;

an inker (13, 14; 54, 55; 96, 97) associated with each cylinder to provide ink thereto;

said system comprising

means for selectively printing on a substrate either continuously, e.g. in a single color, or in two colors with a gap, or interruption in the region of the groove for at least the width of the groove defining said gap comprising

means (30; 70–73; 81; 111, 113; 125–127; 137–139) for selectively locating the circumferential position of the first and second printing cylinders with respect to the web to place, selectively,



(a), for printing continuous subject matter without a gap, the printing line (41) defined by the plate on the first cylinder and the printing line (42) defined by the plate on the second cylinder at longitudinally shifted locations by at least the distance of the width of the gap (43) between succeeding printing lines (41) defined by the plate on the first cylinder to effect, in mode (a) continous printing of subject matter on the web (40) without interruption of subject matter due to the presence of the clamping groove; or

(b), to permit multi-color printing with unprinted gaps on the substrate web (40),

the printing line (41) defined by the plate on the first cylinder and the printing line (42) defined by the plate on the second cylinder in registration to effect printing in mode (b) by the two printing cylinders with a gap (43) of printed subject matter on the web at the location of the clamping groove.

4,437,403

SYSTEM FOR ADJUSTING PRINTING PLATES MOUNTED ON PLATE CYLINDERS

Harry M. Greiner, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 418,094

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136704

Int. Cl.³ B41F *13/24*

U.S. Cl. 101—248 **10 Claims**

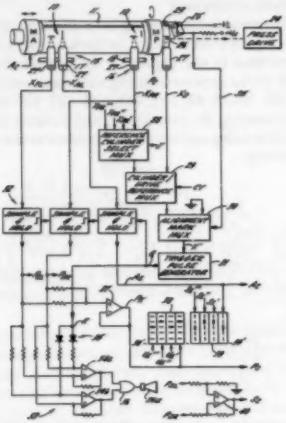
1. An automatic control system for adjusting the printing plates mounted on the plate cylinders of a printing press having a plurality of plate cylinders comprising, in combination,

automatic means for adjusting the plate cylinders in response to at least one register control signal for aligning the printing plates in register with another for the combined printing operation,

means for automatically measuring the positions of the individual printing plates with respect to the press frame to obtain relative position signals,

means for automatically comparing the relative position signal for at least one of the printing plates to at least one corresponding predetermined reference position signal to

generate at least one said register control signal, the reference position signal being preselected as a relative position signal for which the printing plates are substantially in register with one another for the combined printing operation, so that the means for adjusting tends to bring the printing plates in register with one another for the combined printing operation, and



means for selecting a particular printing plate to define the corresponding reference position signal so that the corresponding register control signal for the selected printing plate is substantially zero,

wherein the means for selecting has means for comparing the relative position signals and wherein the means for selecting selects the printing plate having a minimum relative position signal.

4,437,404

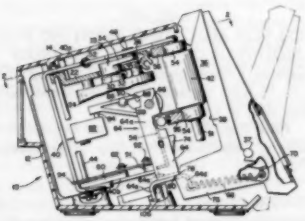
ELECTRIC DATA RECORDER

William P. Barbour, Columbia, Md., assignor to DBS, Inc., Randolph, Mass.

Filed Sep. 24, 1982, Ser. No. 423,017

Int. Cl.³ B41F *3/04*

U.S. Cl. 101—269 **7 Claims**



1. In a data recorder of the type comprising an upstanding main frame, a roller platen carried on the frame, a fork pivoted on the frame arranged to sweep the platen from a home position horizontally through a substantially erect plane printing path and return, a gate including a bed for carrying a form to receive a printing impression, said gate pivotally mounted to swing between an open loading position and a closed printing position, means biasing the gate towards open position, electric motor means for driving said form to sweep the platen through said printing path including a crank engageable in a slot in the fork for driving the same, and switch means for controlling the energization of said motor, the improvement comprising:

means to cause imprinting of said form by said motor means solely during the printing stroke and to then interrupt the said driving connection between the fork and the motor means;

spring means acting on the fork to restore the same to a location placing the platen in home position once the driving connection is interrupted; and

means to effect reestablishment of the driving connection in readiness for a subsequent cycle of operation.

4,437,405

APPARATUS FOR TRANSFERRING INK TO THE INK PLATE OF A METERING MACHINE

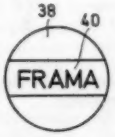
Werner Haug, Langnau, Switzerland, assignor to Frama AG, Switzerland

Filed Apr. 7, 1982, Ser. No. 366,179

Claims priority, application Switzerland, Apr. 30, 1981, 2838/81

Int. Cl.³ B41F *31/00*

U.S. Cl. 101—349 **3 Claims**



1. An apparatus for transferring ink to a metering head of a metering machine having a casing substantially surrounding the metering head, comprising:

the casing having a side wall with a side wall opening therein;

a fixed bearing bolt connected to the machine and extending in the casing;

an interchangeable roller support having a hollow shaft portion engaged through said side wall opening and coaxially onto said bearing bolt, said support having a handle portion and an end portion;

a protective sleeve having an inside diameter large enough to permit passage of said ink storage roller, connected to the casing side wall and extending into the machine from said casing side wall opening;

an ink storage roller rotatably mounted to said hollow shaft portion, said side wall opening being large enough to permit passage of said ink storage roller, said ink storage roller having an axial opening therethrough forming a bearing sleeve therein rotatably mounted on said hollow shaft portion;

at least one ink transfer roller mounted on a frame which is pivotable about an axle which is coaxial with said bearing bolt and being engaged with said ink storage roller, said protective sleeve extending over said ink storage roller and having a lateral opening for permitting contact between said ink storage roller and said ink transfer roller; and

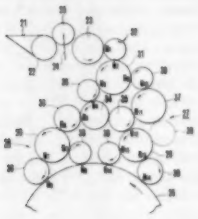
locking means connected between said casing and said interchangeable roller portion for locking said interchangeable roller support with ink storage roller thereon in said side wall opening.

4,437,406

INKING APPARATUS FOR AN OFFSET PRESS

Kokichi Hasegawa, and Tsugio Tokita, both of Ibaragi, Japan, assignors to Komori Printing Machinery Co., Ltd., Japan

Filed Jun. 18, 1982, Ser. No. 389,831
Claims priority, application Japan, Sep. 12, 1981, 56-144339
Int. Cl.³ B41F *31/00*
U.S. Cl. 101—350 2 Claims



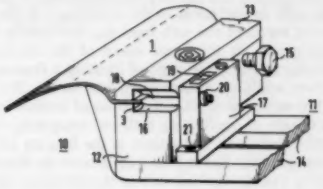
1. An inking apparatus for an offset press, comprising:
a fountain roller having ink thereon;
a first vibrator roller disposed adjacent said fountain roller and spaced apart therfrom;
a ductor roller interposed said fountain roller and said first vibrator roller, said ductor roller being reciprocably movable between said fountain roller and said first vibrator roller for intermittently transferring ink from said fountain roller to said first vibrator roller;
a plate cylinder rotatable in a predetermined direction;
a first roller group and a second roller group, each of said first and second roller groups comprising a plurality of ink form rollers held in contact with said plate cylinder, each of said first and second roller groups further comprising a second vibrator roller held in contact with said plurality of ink form rollers; said first roller group being located upstream of said second roller group with respect to said predetermined direction;
a third vibrator roller;
a first distributor roller interposed said first vibrator roller and said third vibrator roller, said first distributor roller being held in contact with said first vibrator roller and with said third vibrator roller;
three second distributor rollers one of said three second distributor rollers being held in contact with said second vibrator of said first roller group, an other of said three second distributor rollers being held in contact with said second vibrator of said second roller group, and an intermediate one of said three second distributor rollers being interposed said one and said other of said three second distributor rollers, said intermediate one of said three second distributor rollers being held in contact with said one and said other of said three second distributor rollers;
a third distributor roller held in contact with said intermediate one of said three second distributor rollers and with said third vibrator roller;
a fourth vibrator roller held in contact with said other of said three second distributor rollers and
a fourth distributor roller interposed said third vibrator roller and said fourth vibrator roller, said fourth distributor roller being held in contact with said third vibrator roller and with said fourth vibrator roller.

4,437,407

DEVICE FOR CONTROLLING THE CLAMPING OF PRINTING PLATES IN CORRECT REGISTER ON THE PLATE CYLINDER OF AN OFFSET PRINTING MACHINE

Burkhardt Wirz, and Alfred Preuss, both of Munich, Fed. Rep. of Germany, assignors to Grapho Metronic Mess- und Regeltechnik GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,236
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138865
Int. Cl.³ B41F *1/30*
U.S. Cl. 101—409 7 Claims



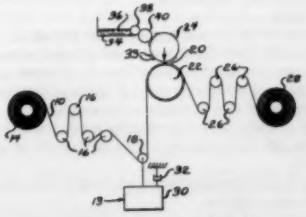
1. Device for controlling the clamping of printing plates in correct register on the plate cylinder of an offset printing machine by means of clamping bars which are arranged in the cylinder channel and on which one end in each case of a printing plate can be held by gripping strips and which are movable in the peripheral direction of the cylinder by means of tightening screws which are screwed into the clamping bars and are supported on either wall of the channel, in which the displacement of the clamping bar holding the front edge of the plate is controllable with respect to the plate cylinder by means of electrical indicator arrangements having a feeler extending in the direction of movement, characterised in that the electrical indicator arrangements (17, 24) with the feeler (18) are fastened to the plate cylinder (10) in the cylinder channel (11), the sensing tip of the feeler (18) lines up with a specific region of the front edge of the printing plate (1), and the positions of the images (4) on the printing plate (1) have a fixed relationship to the specific region (3) of the front edge of the printing plate.

4,437,408

DEVICE FOR APPLYING INDICIA TO AN ELASTIC WEB

Edward J. Arkans, Schaumburg, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 16, 1980, Ser. No. 159,707
Int. Cl.³ B41C *1/02*
U.S. Cl. 101—426 1 Claim



1. A method of determining the amount of tension in an elastic web, by applying indicia in a first, repetitive, geometric form along the lengths of elastic webs stretched into an elongated shape, such that in stretching use of the webs after printing, said indicia in said first form represent a predetermined amount of tension being applied to the webs regardless of the

degree of stretch variation of different webs when each is stretched to attain said predetermined amount of tension, comprising the steps of:

predetermining the amount of tension the indicia in said first form will indicate after printing;

longitudinally stretching an elastic web to said predetermined amount of tension, irrespective of the length of stretch required to be imparted to the web to attain said predetermined amount of tension by suspending the web between a feed means and a retaining roll, the retaining roll having high friction characteristics on the outer surface thereof, the elastic web being formed into a loop between the feed means and the retaining roll;

maintaining said predetermined amount of tension in the web completely and entirely independently of elongation in the web, or variations in the elongation of the web, or speed of travel of the web from the feed means over the retaining roll, or rotational speed of the retaining roll, consisting solely of the steps of locating a floating roll on the loop, applying a downward bias to the floating roll equal to said predetermined amount of tension by attaching a weight to the floating roll, and dampening the floating roll to mitigate fluctuations in the floating roll caused by passage of the elastic web loop around the floating roll, whereby a portion of the web on the retaining roll having high friction characteristics is stretched to a degree equaling said predetermined degree of tension regardless of the degree of elongation imparted to the web to attain the degree of stretch equaling said predetermined degree of tension; and

printing said indicia in said first geometric form while the web is stretch to said predetermined amount of tension by passing the web through a nip defined by the retaining roll and a print roll and while the web is stretched as aforesaid on the retaining roll, said indicia, after the web is relaxed and allowed to return to an unstretched condition, assuming a second geometric form which is other than said first geometric form, said first and second geometric forms, when compared, being readily visually perceived as being different.

4,437,409

SPIN-STABILIZED SABOT PROJECTILE FOR OVERCOMING A HETEROGENEOUS RESISTANCE

Pierre Freymond, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Continuation of Ser. No. 36,768, May 7, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,664

Claims priority, application Switzerland, May 30, 1978, 5870/78

Int. Cl.³ F42B *11/24, 13/16*

U.S. Cl. 102—364 **5 Claims**

1. A spin-stabilized sabot projectile for overcoming a heterogeneous resistance, comprising:

sabot means;

a projectile body carried by said sabot means;

said projectile body having an axial channel means for obtaining an increased radial effect of splinters or the like from the projectile body upon fragmentation thereof after penetration of said heterogeneous resistance;

said axial channel means containing an incendiary charge;

said projectile body having a specific weight of at least 17 gr/cm^3;

said axial channel means having a forward end region and an intermediate region;

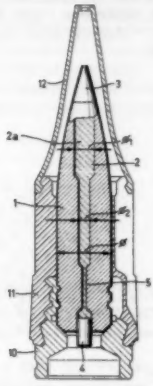
said forward end region of said axial channel means having a larger diameter than said intermediate region;

said projectile body having a front region;

a ballistic hood means for closing said front region of said projectile body;

said axial channel means possesses at said forward end region a diameter amounting to approximately 40% of the diameter of the projectile body, such that the projectile body continuously crumbles away at the region of said axial channel means upon penetration of the projectile body at the heterogeneous resistance;

said axial channel means possessing at said intermediate



region a diameter amounting to approximately 20% of the diameter of said projectile body; and

said axial channel means being filled with said incendiary charge such that the penetration depth of the projectile is conformed to the radial effect of said projectile.

4,437,410

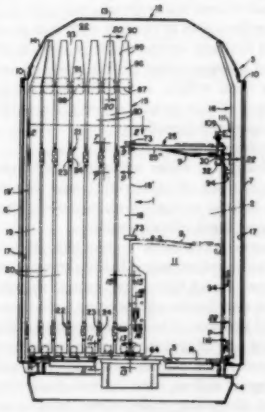
PIVOTAL SLIDABLE VEHICLE END ENCLOSURE

David A. Stoller, Sr., Dunwoody, Ga.; James C. Robertson, Ypsilanti, and Tibor Matyas, Northville, both of Mich., assignors to Portec, Inc., Oak Brook, Ill.

Filed Oct. 9, 1981, Ser. No. 310,307

Int. Cl.³ B61D *3/02*; B60J *5/10*

U.S. Cl. 105—378 **15 Claims**



1. An end enclosure for a transport vehicle having a floor and two side walls defining a vehicle interior therebetween terminating in an end opening, at least one elevated deck spaced above said floor and having lateral edges spaced inwardly from said side walls and a front edge juxtaposed said end opening, said enclosure comprising a pair of door assemblies adapted to be displaced between a closed position overlying said end opening and an opened position spaced outwardly

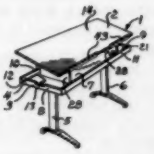
of a respective one of said deck lateral edges and disposed fully within said vehicle interior, said door assemblies each including a plurality of vertically disposed adjacent panels bounded by an inner and outer panel, hinge means intermediate and pivotally joining adjacent ones of said panels, an elongated support member disposed within said vehicle interior in a horizontal plane, said support member having an end portion disposed outwardly beyond said deck front edge and joined in a continuous curved manner with side portions respectively disposed above and outwardly of said deck lateral edges, means fixedly mounting said support member relative said deck, means suspending said door assemblies from and outwardly of said support member, said suspension means including a plurality of hanger assemblies attached to said panel hinge means, said hinge means including male and female hinge elements joined by a hinge pin, said hanger assemblies each provided with a pair of opposed horizontal offset elements projecting outwardly toward each said door assembly and engaging opposite ends of said hinge pins to captively support said door assemblies, said hanger assemblies each provided with a tracking element disposed within said support member, and panel guide means carried by the bottom of said door assemblies cooperating with guide means adjacent said vehicle floor, said guide means adjacent said vehicle floor including an upstanding rail extending substantially continously throughout the extent of displacement of said two door assemblies, said panel guide means including a plurality of individual spaced-apart guide pins projecting downwardly from said panels and straddling said rail, forward and rearward bumpers projecting inwardly from said inner and outer panels respectively, forward and rearward stops mounted inwardly of said vehicle side walls adjacent said floor guide means and respectively engaged by said forward and rearward bumpers when each said door assembly is fully disposed in said opened position, said forward stop mounted at a position selected to engage said rearward bumper when each said door assembly is fully disposed in said closed position whereby, lateral force applied to any one of said panels concurrently displaces all said panels of its respective said door assembly between said closed and opened positions.

4,437,411

MULTI-POSITION STUDENT TABLE

Ronald M. Maxwell, Leland, Mich., assignor to General Equipment Manufacturers, Jackson, Miss.

Filed Apr. 20, 1981, Ser. No. 255,807
Int. Cl.³ A47F *5/12*
U.S. Cl. 108—1 **13 Claims**



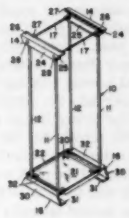
1. Apparatus for rigidly positioning a top panel at a first or a second height comprising: a base; first engagement members secured to said base; a top panel providing a work surface adapted to be positioned at one of said heights relative to said base; first and second side supports hingedly mounted to said base in spaced relation and movable between a first storage position in which said supports lie flat within said base and said top panel is supported by said base, and a second position in which said supports are raised and said top panel is supported by said first and second support means at a height above said first position; brace means for rigidly securing said first and second support means in said raised position; and manual latch means comprising a reciprocable latch member slidably carried on the under surface of said top panel and manually moveable between a latch position and a release position for rigidly securing said top panel to said base at said first height by coupling to said first engagement members when said side supports are placed in said storage position and for rigidly securing said top panel to said side supports when the same are placed in said second position and said latch member is in said latch position.

4,437,412

FOLDING PALLET

Jerrold A. Trautsch, New Lisbon, Wis., assignor to Leer Manufacturing Company, Inc., New Lisbon, Wis.

Filed Jun. 8, 1982, Ser. No. 386,236
Int. Cl.³ B65D *19/12*; A47B *43/00*; F16D *1/12*
U.S. Cl. 108—56.1 **13 Claims**



1. A folding pallet comprising:

(a) a pair of base members disposed in parallel relation;

(b) a pair of top side members disposed in parallel relation above the base members;

(c) a pair of front vertical posts rotatably mounted at their ends to the base members and top side members, one front post extending from one base member to the top side member above it and the other front post extending from the other base member to the other top side member above it, the posts being tubular, having a cylindrical exterior surface and a cylindrical interior surface;

(d) a pair of back vertical posts rotatably mounted at their ends to the base members and to the top side members, one back post extending from one base member to the top side member above it and the other back post extending from the other base member to the other top side member above it, the posts being tubular, having a cylindrical exterior surface and a cylindrical interior surface;

(e) a pair of top cross rods, one cross rod attached to and between the front posts near the top ends thereof and the other top cross rod attached to and between the back posts near the top ends thereof;

(f) a pair of bottom cross rods, one cross rod attached to and between the front posts near the bottom ends thereof and the other cross rod attached to and between the back posts near the bottom ends thereof;

(g) a bottom tray pivotally mounted to a bottom cross rod for rotation from a horizontal position in which the tray covers a substantial portion of the area at the bottom of the pallet between the front and back posts and a vertical position in which the tray is substantially parallel to the back posts, whereby the pallet may be folded from an erected position in which the posts, base members, top side members, and cross rods generally define the shape of a rectangular parallelepiped to a folded position by raising the tray from its horizontal to its vertical position and drawing either pair of diagonally opposite back posts and front posts toward each other until the pallet collapses to a substantially flat configuration;

wherein the top side members are formed as U-shaped channels, having a vertical web section and a horizontal lower flange and a horizontal upper flange extending therefrom, and each top side member including, for each vertical post

rotatably mounted to the top side member, an opening in the lower horizontal flange which is slightly larger than the outside diameter of the post, through which the post passes, a ferrule on the lower flange extending upwardly from the opening and having a cylindrical interior with a diameter slightly larger than the outside diameter of the post, and another ferrule on the upper flange extending downwardly concentric with the lower ferrule and having an outside diameter which is slightly less than the inside diameter of the post, whereby each post will be held between the two ferrules with which it is engaged so that it cannot be moved laterally but can rotate about its own axis, and

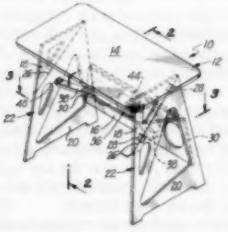
wherein the base members are formed as U-shaped channels having a central vertical web section and a horizontal lower flange and a horizontal upper flange extending therefrom, and each base member including, for each vertical post which is rotatably mounted to the base member, an opening in the upper flange of the base member which is slightly larger in diameter than the outside diameter of the post, through which the post passes, a ferrule on the upper flange extending downwardly from the opening and having a cylindrical interior with a diameter slightly larger than the outside diameter of the post, and a ferrule on the lower flange extending upwardly concentric with the ferrule on the upper flange and having a cylindrical exterior with a diameter slightly less than the inside diameter of the post, whereby each post will be held between the two ferrules with which it is engaged so that it cannot be moved laterally but can rotate about its own axis.

4,437,413

FOLDING STRUCTURE EMPLOYING A SARRUS LINKAGE

Edward D. O'Brian, 2125 W. Falmouth, Anaheim, Calif. 92801, and Charles Phelan, Tustin, Calif., assignors to Edward D. O'Brian, Anaheim, Calif.

Filed Sep. 8, 1981, Ser. No. 300,060
Int. Cl.³ A47B *3/00*
U.S. Cl. 108—111 **13 Claims**



1. A folding structure including a six member Sarrus linkage having two opposed links and two sets of connecting links, each of said sets including two separate links, the connecting links of each of said sets having adjacent edges hingedly connected to one another, a first connecting link of each of said sets being hingedly connected to a first of said opposed links, the second connecting link of each of said sets being hingedly connected to the second of said opposed links, said sets of connecting links being spaced from one another, in which the improvement comprises:

a control link means pivotally connected to said second of said opposed links,

a motion transmitting link means pivotally connected to said control link means and to a connecting link of one of said sets of connecting links,

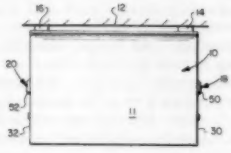
said control link means and said motion transmitting link means being connected to one another and to said Sarrus linkage so that said control link means may be pivoted relative to said one of said opposed links and so that such motion of said control link means will be transmitted in order to cause relative movement between said opposed links so as to move said opposed links toward one another as said structure is being folded and so as to move said opposed links away from one another as said structure is being unfolded.

4,437,414

FOLDING TABLE FOR WALL MOUNTING

Tony Brescia, Liverpool, and Ross Deacon, Syracuse, both of N.Y., assignors to Syroco, Inc., Syracuse, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,137
Int. Cl.³ A47B *5/04*
U.S. Cl. 108—134 **10 Claims**



1. A wall mountable folding table adapted for positioning substantially flush against a vertical wall in a first position and generally orthogonal thereto in a second, rotated position, said table comprising:

a generally planar table surface having top and bottom surfaces and side frame members on opposite sides thereof defining a space therebetween and under said table surface;

at least one wall mountable support bracket adapted to be secured against a generally vertical wall and pivotally connected to said table for the support thereof and being constructed of a size affording its receipt substantially within the area of the side frame members in said space therebetween;

first and second support arms pivotally connected to said side frame members at one end and to said support bracket at an opposite end, each of said support arms having an intermediate pivot connecting upper and lower portions of said support arm for permitting relative rotation therebetween and relative to said table surface and said support bracket;

said upper portion of said support arm being received against said botom table surface when said top table surface is oriented generally orthogonal to said support bracket in said second position;

said side frame members of said folding table including latching means for locking said arms in a supporting position relative to said table surface when said table surface is oriented generally orthogonal to said support bracket in said second position;

said latching means including a slot formed in at least one of said side frame members and a sliding member mounted therein for rectilinear movement relative to said adjacent support arms for the engagement thereof;

at least one of said adjacent support arms including a slot formed therein for receiving said slide member of said latching means mounted upon said side frame member for the locking of said support arm by the rectilinear movement of said latching means and wherein said latching means is positioned adjacent said intermediate pivot of said adjacent support arm when said upper support arm is received against said bottom table surface;

said lower portion of said support arm depending from said intermediate pivot in direct structural relationship between said bottom table surface and said support bracket

when said top table surface is oriented generally orthogonal to said support bracket in said second position; and

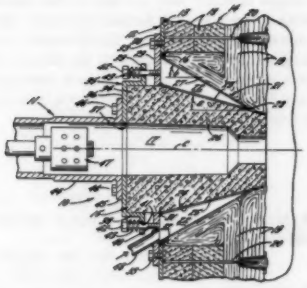
said support arms being constructed of a width substantially no greater than the width of said table side frame members for the foldable receipt of said support arms adjacent said side frame members in said space therebetween when said table is pivoted into said first position against said vertical wall.

4,437,415

BURNER BLOCK ASSEMBLY FOR INDUSTRIAL FURNACES

Lyle S. Spielman, Rockford, Ill., assignor to Eclipse, Inc., Rockford, Ill.

Filed Jul. 28, 1982, Ser. No. 402,758
Int. Cl.³ F23L *5/00*
U.S. Cl. 110—182.5 **4 Claims**



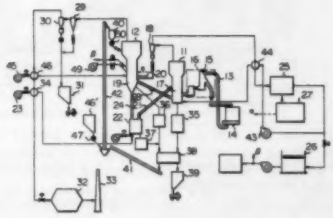
1. For use with a furnace having a metal shell and a refractory lining on the inner side of the shell, a burner block assembly having, in combination, a hollow annular member closed at both ends to define an annular cooling chamber and adapted to project through a hole in the shell and into the lining with one end of the member disposed adjacent the shell, said member having a predetermined rate of thermal expansion and haing an inner wall which defines a central opening with the opening being conical and becoming smaller in cross section from said one end to the other end, said member also including a radial flange overlapping the shell around the entire periphery of the hole and adapted to be attached to the shell, a burner block made of refractory material and having an inner portion projecting into said opening, the cross sectional shape of said inner end portion being conical and complemental to the cross sectional shape of said opening whereby the end portion is seated against said inner wall, said burner block having a rate of thermal expansion significantly different from said predetermined rate, and means mounting said block on said annular member and including resilient means urging said inner end portion axially inwardly and firmly against said inner wall while permitting relative axial movement caused by the different rates of thermal expansion, said annular member having at least one inlet port and at least one outlet port to permit a cooling fluid to be circulated through said chamber thereby to remove heat from said annular member.

4,437,416

APPARATUS FOR PYROLYZING

Yoshiaki Ishii; Tsutomu Kume; Naoyoshi Ando, and Shosaku Fujinami, all of Kanagawa, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 199,543, Oct. 22, 1980, Pat. No. 4,344,373.
This application May 26, 1982, Ser. No. 382,350
Claims priority, application Japan, Oct. 30, 1979, 54-139271; Oct. 30, 1979, 54-139272
Int. Cl.³ F23D *1/00*; F23G *5/00*
U.S. Cl. 110—245 **7 Claims**



1. An apparatus for effecting pyrolyzation in a two-bed fluidized pyrolysis system, said apparatus comprising:

a pyrolysis reactor of the fluidized bed type with sand as the fluidized medium;

a combustion reactor of the fluidized bed type including a lower portion for receiving sand from said pyrolysis reactor and an upper portion where combustion is effected and into which sand is lifted from said lower portion;

coupling conduit means for coupling an upper part of said pyrolysis reactor with said lower portion of said combustion reactor, and for coupling said upper portion of said combustion reactor with a lower part of said pyrolysis reactor;

means for sensing physical factors concerning the state of fluidization and including:

means for sensing the pressure difference between the free boards of said two reactors;

means for sensing the pressure difference between said upper and lower portions of said combustion reactor; and

means for determining the levels of fluidized beds of said two reactors by measuring the pressure difference between the upper and lower portions of the respective said fluidized bed of each said reactor;

control means for regulating the values of said physical factors; and

sand lifting means for lifting sand upwardly from said lower portion of said combustion reactor into said upper portion of said combustion reactor and including:

a lifting conduit coupling said lower portion and said upper portion;

nozzle means for injecting pressurized gas into a lower end of said lifting conduit;

a ring gap means surrounding said nozzle through which air is blown around the nozzle;

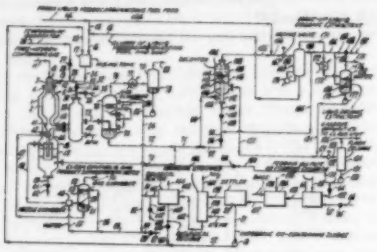
means for regulating flow rate of gas injected through said nozzle; and

regulating means for regulating flow rate of air blown from said ring gap means.

4,437,417
ENVIRONMENTALLY SAFE PROCESS FOR DISPOSING OF TOXIC INORGANIC CN-CONTAINING SLUDGE

Roy D. Roberts, Chino, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,470
Int. Cl.³ F23G 7/04
U.S. Cl. 110—346 **16 Claims**



1. A pollution abatement process for a toxic inorganic CN-containing sludge comprising

(1) mixing together the toxic CN-containing sludge from (6) and a liquid hydrocarbonaceous fuel to produce a fuel mixture;

(2) reacting the fuel mixture from (1) by partial oxidation with a free-oxygen containing gas and a temperature moderator in the reaction zone of a free-flow partial oxidation gas generator at an autogenous temperature in the range of about 1700° to 3000° F. and a pressure in the range of about 10 to 200 atmospheres to produce an effluent gas stream substantially comprising H_2, CO, CO_2, at least one gas from the group consisting of H_2O, CH_4, H_2S, COS, N_2, and Ar, and containing particulate carbon, ash and trace amounts of HCN, HCL and NH_3;

(3) introducing the effluent gas stream from (2) into a gas quench cooling and/or scrubbing zone, and producing a carbon-water dispersion containing dissolved formic acid and a separate stream of raw synthesis gas, reducing gas or fuel gas;

(4) resolving said carbon-water dispersion in a decanting zone to produce a carbon-liquid hydrocarbonaceous fuel slurry and water containing free and combined cyanides; halides of ammonium or a metal selected from the group sodium, calcium, iron, nickel, and mixtures thereof; formates; sulfides, thiocyanates; ammonia; and metal constituents selected from the group consisting of nickel, vanadium, iron, and mixtures thereof;

(5) mixing at least a portion of the water from (4) at a temperature in the range of about 125° to 200° F., and a pH in the range of about 7 to 9 with a ferrous salt thereby converting a substantial portion of said cyanides to iron cyanides, adding a base to increase the pH to a value in the range of about 9–11, and precipitating said toxic inorganic CN-containing sludge in said water; and

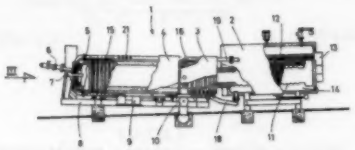
(6) separating the suspended CN-containing sludge from the water in a separating zone.

4,437,418
METHODS OF AND APPARATUS FOR TREATING WASTE PRODUCTS

Paul Guillaume, Ivry-sur-Seine, and Pierre Karinthi, Grenoble, both of France, assignors to L'air Liquide, Societe Anonyme Pour L'etude et L'exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 20, 1981, Ser. No. 323,251
Claims priority, application France, Dec. 5, 1980, 80 25901
Int. Cl.³ F23G 5/06
U.S. Cl. 110—246 **7 Claims**

1. In apparatus for treating waste products of the type comprising an incinerator furnace including at least one rotary section having a peripheral wall for the combustion and/or pyrolysis of the waste products and a stationary section between said rotary section and a recuperator and having a peripheral wall for guiding exhaust fumes generated in said furnace from the rotary section; said recuperator including means for causing the exhaust fumes to flow in a state of heat exchange with a heat-carrier fluid for exploitation of the heat thus recovered; the improvement which comprises a circuit for recovery of the heat of the furnace, said circuit conducting a flow of heat-carrier fluid in the direction extending from said recuperator toward the peripheral wall of one or both of said

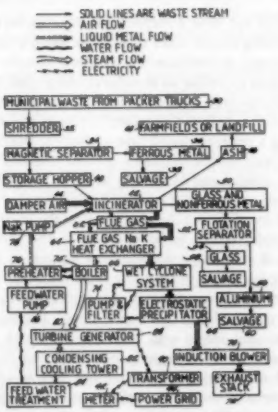


stationary section and said rotary section of said furnace and in the direction returning from said peripheral wall toward said recuperator to preheat the fluid in said recuperator, wherein said circuit comprises juxtaposed tubes connected in parallel between a distributor duct and a collector duct, which ducts are arranged opposite and parallel to one another longitudinally with respect to said furnace, wherein said tubes, with sheet metal elements welded therebetween, form a casing delimiting the volume occupied by the fumes within said furnace, and wherein some of said tubes at least partially form a stationary front closing off said furnace at an extremity thereof remote from said recuperator.

4,437,419
INCINERATOR

Karl R. Hertel, Delafield, Wis., assignor to Pyro-Gen Corp., Waukesha, Wis.

Filed Sep. 22, 1982, Ser. No. 421,608
Int. Cl.³ F23G 3/00, 5/00, 7/00
U.S. Cl. 110—259 **35 Claims**



1. A waste incinerating and resource reclaiming device, comprising:

A. a substantially closed flue chamber having walls, a draft air inlet, a waste inlet, a flue gas outlet, and a combustion zone between said draft air inlet and said flue gas outlet;

B. support means for receiving and maintaining unburned waste in said combustion zone;

C. burned waste conveying means for feeding burned waste from said combustion zone to a position above said draft air inlet, so that air drawn through said draft air inlet separates said burned waste into heavy and light fractions as said waste drops from said position; and

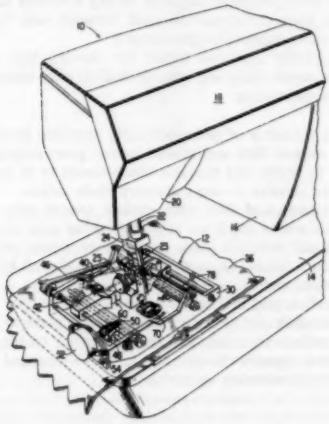
D. first and second conveyor means, respectively disposed in the paths of said heavy and light fractions, for separately conveying said heavy and light fractions from said flue chamber.

4,437,420

DRIVE ROLL MONOGRAMMER

Kenneth M. Johnson, Westfield, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Dec. 7, 1981, Ser. No. 327,861
Int. Cl.³ D05C 1/02
U.S. Cl. 112—103 4 Claims



1. A work manipulating mechanism for use with a sewing machine having a frame including a work supporting bed, said frame supporting a presser bar, a needle bar, a sewing needle supported on the end of said needle bar, means for supporting said needle bar for endwise reciprocation in the formation of stitches, and actuating means for implementing endwise reciprocation of said needle bar, said work manipulating mechanism comprising:

a pair of spaced apart rollers;

means for rotatably supporting said rollers in contact with work material supported on said work supporting bed, said supporting means including a substantially rectilinear peripheral frame;

a first shaft rotatably supported by said peripheral frame paralleling said rollers;

means for connecting said shaft to said rollers to transmit rotation of one to the other;

a first drive means carried by said peripheral frame and operatively connected to said first shaft for transmitting selected rotation to said rollers;

a second shaft supported by said peripheral frame parallel to said first shaft;

a bridge extending above said rollers and slidably supported by said first and said second shafts;

means on said bridge for connecting said bridge to said presser bar for support thereof;

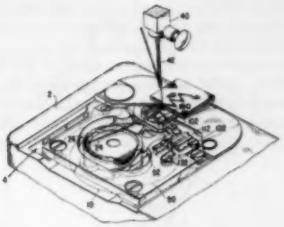
and a second drive means supported by said bridge and operatively connected to said peripheral frame for selectively moving said peripheral frame relative to said bridge.

4,437,421

VARIABLE PULL OFF FOR BOBBIN THREAD

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 204,426, Nov. 6, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,556
Int. Cl.³ D05B 3/02, 27/22, 27
U.S. Cl. 112—158 R 5 Claims



1. In a sewing machine having a bed and stitch forming instrumentalities including a thread carrying needle, said needle having an endwise reciprocating motion imparted thereto so that said needle will penetrate a work piece supported by said bed, a feed dog for effecting movement of the work piece in cooperation with said needle, said needle being capable of having a jogging motion imparted thereto which is lateral to the direction of said movement of the work piece to produce zig zag stitches, a loop taker adapted to operate in cooperation with said needle in the formation of lockstitches and having a bobbin accommodating cavity, a thread carrying bobbin disposed in said cavity, a bobbin thread tensioning device associated with said bobbin for tensioning bobbin thread as it is pulled from said thread carrying bobbin, said bobbin thread following thread paths of varying length between said thread tensioning device and the different laterally jogged positions of said needle penetration; an arrangement for pulling thread from said thread carrying bobbin to effect uniform zig zag stitches comprising: (a.)

a movable bobbin thread pull-off member having a thread engaging surface transverse to said thread paths, said thread engaging surface having different portions arranged for engagement with said bobbin thread in each of the different laterally jogged positions of needle reciprocation; (b.)

means for effecting movement of said bobbin thread pull-off member in a fixed path cyclically and in timed relation with said stitch forming instrumentalities, and with said different portions of the thread engaging surface each partaking of an extent of movement different from other portions while in engagement with said bobbin thread; (c.)

whereby said bobbin thread pull-off member is effective to pull from said bobbin an amount of bobbin thread subsequent to each different laterally jogged position of said needle penetration which amount of bobbin thread pull-off is substantially proportional to the extent of movement of said thread engaging portion in engagement with said bobbin thread.

4,437,422

STOP CONTROL MECHANISM FOR FEEDING A MATERIAL TO A WORK PERFORMING MACHINE

Julio B. Torres, 981 Arapahoe St., Los Angeles, Calif. 90006

Filed Feb. 22, 1982, Ser. No. 350,979
Int. Cl.³ B65H 63/02, 63/06, 25/00; D05B 69/36
U.S. Cl. 112—272 7 Claims

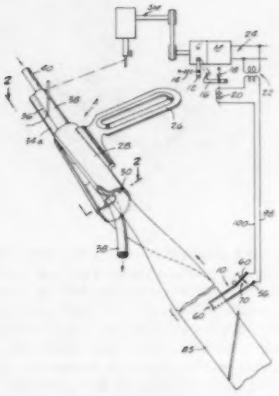
1. As an article of manufacture, a control switch for interrupting the operation of a power driven sewing machine in which a fabric bias binding strip-material is fed to a work performing attachment operatively associated with said machine, and wherein the operation of said control switch is

responsive to the presence of one or more predetermined abnormal conditions of said binding strip-material, said switch comprising:

a supporting bracket frame structure;

an elongate fixed switch member mounted on said bracket;

an elongate rocker arm switch member hingedly mounted between its ends on said bracket, and axially extending generally along the fixed switch member;



a first set of operatively associated contacts respectively mounted on said switch members on one side of the hinge mounting;

a second set of operatively associated contacts mounted on said switch members on the other side of the hinge mounting; and

said sets of contacts being so arranged that when the contacts of one of said sets is closed, the contacts of the other set will be open.

4,437,423

THREAD TRIMMING DEVICE FOR A SEWING MACHINE

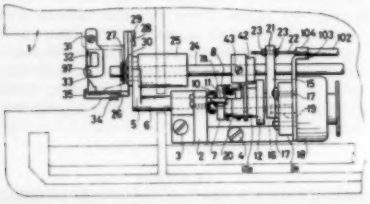
Masayuki Yamazawa, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Feb. 22, 1982, Ser. No. 351,210

Claims priority, application Japan, Feb. 26, 1981, 56-28149

Int. Cl.³ D05B 65/02

U.S. Cl. 112—292 **2 Claims**



1. A thread trimming device for a sewing machine, said device comprising:

(a) a first shaft rotably driven by the main shaft of the sewing machine;

(b) a first ratchet means disposed on said first shaft and rotable therewith, said first ratchet means comprising a first partial gear having:

(i) a first peripheral segment having teeth thereon;

(ii) a second peripheral segment having a first cam surface formed thereon adjacent to said first peripheral segment on one side thereof;

(iii) a third peripheral segment having a first radial projection formed thereon; and

(iv) fourth and fifth peripheral segments having blank surfaces thereon disposed between said second and third peripheral segments and between said first and third peripheral segments, respectively;

(c) a stationary blade means fixably secured to the framework of the sewing machine;

(d) a second shaft disposed parallel to said first shaft;

(e) pivotably movable blade means operably connected to said second shaft;

(f) a second rachet means disposed on said second shaft and axially movable relative thereto so as to selectable engage said first rachet means, said second rachet means comprising a second partial gear having:

(i) a first peripheral segment having teeth thereon;

(ii) a second peripheral segment having a second radial projection formed thereon; and

(iii) a third peripheral segment having a second cam surface formed thereon disposed between said first and second peripheral segments; and

(g) electrically operable means for moving said second rachet means along said second shaft so as to engage said first rachet means,

whereby:

(h) upon actuation of said electrically operable means, said teeth on said first and second partial gears engage each other to rotate said movable blade means to an operable position relative to said stationary blade means;

(i) thereafter, said first cam surface comes into sliding contact with a tooth on said first partial gear to slowly rotate said movable blade means to cooperate with said stationary blade means to perform the thread trimming operation; and

(j) thereafter, said first radial projection comes into sliding contact with said second radial projection and said second cam surface to rotate said second rachet means in the direction opposite the direction in which it rotated during the thread trimming operation.

4,437,424

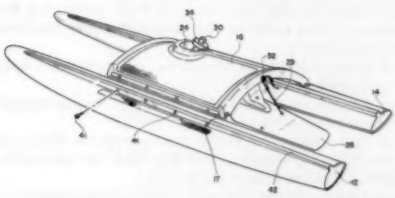
PARTIALLY RESTRAINED ARRANGEMENT FOR THE MAST AND SAIL OF A CRAFT POSSESSING INHERENT STABILITY

Douglas W. Lord, Orlando, Fla., assignor to Julian C. Renfro, Winter Park, Fla.

Continuation-in-part of Ser. No. 269,486, Jun. 2, 1981, abandoned. This application Jun. 24, 1983, Ser. No. 507,459

Int. Cl.³ B63B 15/00

U.S. Cl. 114—91 **21 Claims**



1. In a wind propelled boat of the sailboard type, a generally cone-shaped sail mounting member secured on the deck of the boat, a portion of said generally cone-shaped member being designed to receive the base of a mast such that it will be movable only for a limited angular extent around interior portions of said generally cone-shaped member, means for securing a lower part of the mast in the apex of said generally cone-shaped member, the front interior of said generally cone-

shaped member being relatively straight across, with said front interior merging by the use of rounded contours with interior portions to each side of said front portion, thereby to define preestablished locations therein, such that the mast can be moved to a preestablished location that is forward and to the left, or to a preestablished location that is forward and to the right, the interior of said generally cone-shaped member also presenting a rounded location in the aft center such that the mast can be supported and restrained by an interior surface of said generally cone-shaped member when the mast has been moved into any of a plurality of selected positions.

4,437,425

AIR FLOW DIRECTION INDICATOR

Nils H. Unden, Essingekroken 8, S-11265 Stockholm, Sweden

Filed Dec. 8, 1981, Ser. No. 328,642

Claims priority, application Sweden, Dec. 16, 1980, 8008835

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—102 **5 Claims**

1. An airflow direction indicator for sailboards having a mast mounted to be tiltable in all directions relative to the sailboard and provided with a sail having its front edge formed to a tunnel which is slipped onto the mast and is turnable relative thereto to suit the sail curvature, characterized by a fitting supporting a wind vane rotatably mounted on a mounting shaft forming an acute angle with the main longitudinal direction of the fitting and tunnel, respectively, the fitting being adapted to be secured to the forward portion of the tunnel to follow the movements of the tunnel relative to the mast, and said wind vane having its main longitudinal direction provided substantially parallel with the longitudinal direction of the fitting and being biased to return to a substantially vertical, neutral position adjacent the fitting, whereby the vane will indicate changes in the direction of the flow of air around the forward edge of the sail, the angle of the mounting shaft to the longitudinal direction of the fitting and tunnel, respectively, being about 20° to 60°, the main portion of the wind vane being situated above the mounting shaft in the neutral position of the vane, the vane being counterbalanced to be biased to return to its neutral position, the wind vane having the shape of a wing with a substantially straight backward edge which is substantially parallel to the longitudinal direction of the fitting and tunnel, respectively, when the vane is in its neutral position.

4,437,426

WING TYPE AIR FOIL ASSEMBLY

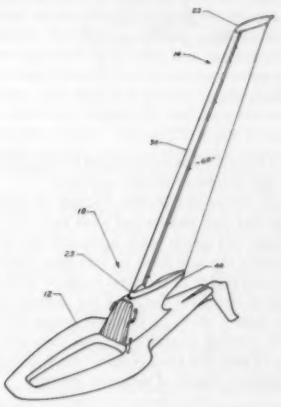
Ronald D. Latham, Apex, N.C., assignor to Fiberglass Unlimited, Inc., Durham, N.C.

Filed Dec. 21, 1981, Ser. No. 333,025

Int. Cl.³ B63H *9/04*; B64C *9/24*

U.S. Cl. 114—103 **9 Claims**

1. A relatively simple and effective wing type air foil for a vessel that utilizes wind to drive the same, comprising: a wing type air foil assembly including an elongated spar; a tip member secured about a top portion of said spar; a root member secured to a lower portion of said spar and spaced from said tip member; flexible line member means secured to and between said root member and said tip member for supporting and stabilizing said spar, said flexible line member means including opposite and counteracting forward and rear runs with said forward run being spaced forwardly of said spar and the rear run spaced rearwardly of said spar and wherein said forward and rear runs extend between said tip and root member and cooperate to structurally support and stabilize said spar such that opposite and counteracting forces provided by the forward and rear runs relative to the spar maintains the spar erect and prevents the spar from significantly bending or from developing and "S" curve shape; a skin covering operatively interconnected between said spar and said rear run of said flexible line member means and including first and second opposite sides that effectively form a variable camber wing air foil with leading and trailing edges; a slat disposed externally of and adjacent to the leading edge of said variable camber wing air foil and movably mounted on the forward run of said flexible line member means, said slat having a trailing edge normally spaced from said spar for defining slot means therebetween for effectively increasing the lift and consequently the thrust of said wing type air foil assembly, said slot means



functioning to direct a relatively high speed flow of air through said slot means for meeting and joining a system of air passing over the upper surface of the variable camber wing air foil for effectively increasing the speed of the flow of air passing over the upper surface of said variable camber wing air foil resulting in the air flow passing across the upper surface of the variable camber wing air foil remaining in contact therewith over a greater portion of the upper surface of the variable camber wing air foil whereby by delaying the time that the passing air separates from contact with the upper surface of said variable camber wing air foil results in the wing type air foil assembly experiencing greater lift and thrust; mounting means for movably mounting said spar and the wing type air foil assembly to said vessel; and control means operatively connected to said wing type air foil assembly for enabling the same to be moved relative to said vessel for enabling the wing type air foil assembly to be selectively oriented with respect to the directions of the wind.

4,437,427

BREAK BOLLARD

Johannes J. Mampaeij, 98 Abeelstraat, 3329 AG Dordrecht, Netherlands

Filed Feb. 17, 1982, Ser. No. 349,522

Claims priority, application Netherlands, Feb. 20, 1981, 8100866

Int. Cl.³ B63B *21/06*; E02B *3/22*

U.S. Cl. 114—218 **3 Claims**

1. An improved break bollard including

a base plate having a central threaded bore and being adapted to be anchored to a stationary support,

a central post having a removable enlarged cap on one end and a sole plate on an opposite end, and

threaded bolt means for securing said central post and said sole plate to said base plate

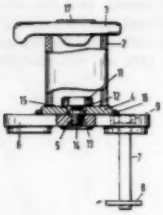
wherein the improvement comprises:

an aperture in said sole plate aligned with the central threaded bore in said base plate;

a threaded portion along one end of said bolt means engaged in said central threaded bore;

a first head portion on said bolt means terminating said threaded portion;

a second head portion at the other end of said bolt means, said second head portion being of larger diameter than



said first head portion and adapted to engage the sole plate around the periphery of said aperture;

a weakened region of incipient fracture on said bolt means between said first and second head portions; and

said threaded bolt means being tightened into said base plate for retaining the sole plate on said base plate; and

said weakened region of incipient fracture being fractured in response to excessive force on the central post whereby the first head portion on said bolt means and its attached threaded portion in said base plate may be removed by rotation of said first head portion which is located beneath the weakened region of incipient fracture.

4,437,428

DEVICE FOR GENERATING SOUND WAVES AT RELATIVELY HIGH FREQUENCIES

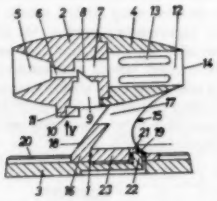
Volkwin Hoffelner, Grillgasse 11, A-1110 Wien, Austria

Filed Mar. 19, 1982, Ser. No. 359,910

Claims priority, application Austria, Mar. 20, 1981, 1338/81

Int. Cl.³ B06B *1/00*; G08B *3/00*

U.S. Cl. 116—137 R **9 Claims**



1. A device for generating sound waves for use with a motor vehicle, said device comprising:

a frustoconical body;

means for mounting said body on said motor vehicle; and

a flue pipe within said body adapted for channelling an air stream to generate sound waves, said flue pipe comprising:

an inlet funnel for initially receiving said air stream;

a blowing passage for receiving air from said inlet funnel;

a resonant chamber for receiving air from said blowing passage;

a sharp edge in said resonant chamber for interrupting the flow of said air stream;

a horn for receiving air from said resonant chamber for producing sound waves; and

a passage for receiving air from said resonant chamber, said passage being larger in cross-section than said resonant chamber.

4,437,429

ANIMAL LITTER

Joel Goldstein, Ambler, and Albert Abrevaya, Chalfont, both of Pa., assignors to Aquarium Pharmaceuticals, Inc., Perkasie, Pa.

Filed Aug. 4, 1981, Ser. No. 289,864

Int. Cl.³ A01K *1/015*

U.S. Cl. 119—1 **18 Claims**

1. A method for reducing ammonia odor from sorptive, non-colloidal granular aluminosilicate containing animal litter which comprises adding uncalcined hydrated zeolite to said litter in an amount effective to reduce the ammonia odor.

4,437,430

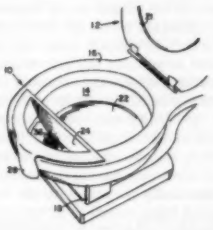
METHOD AND APPARATUS FOR TRAINING CATS TO USE A TOILET BOWL

Martha G. DeBardeleben, 219 Mercer St., Princeton, N.J. 08540

Filed Apr. 26, 1982, Ser. No. 371,559

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—1 **1 Claim**



1. A toilet apparatus for training cats to use a toilet bowl comprising:

a unitary plastic receptacle means for holding cat litter material, including a substantially vertical back wall and a sloping floor;

a substantially flat flange attached to said receptacle means, said sloping floor extending from the bottom of said back wall upwards towards said flange;

aperture means in said receptacle means for draining said receptacle means, said aperture means being sufficiently large enough to drain said receptacle means of liquid, but small enough to prevent any substantial portion of said cat litter material from passing therethrough, said aperture means comprising holes in said sloping floor; and,

attachment means for attaching said receptacle means to a standard commode so that said receptacle means sits substantially inside of said commode, said attachment means being attached to said substantially flat flange and including an overlapping tab means for engaging the front exterior portion of said commode bowl, said tab means comprising a single wide overlapping tab,

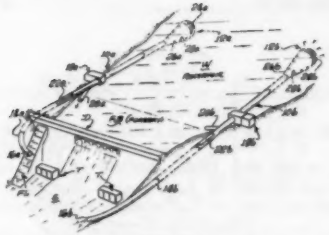
wherein said receptacle means takes up no more than approximately one-sixth of the open area of the top of said bowl and is located towards the front of said bowl so that said commode may be used by human beings without necessitating removal of said apparatus.

4,437,431

METHOD AND APPARATUS FOR DIVERSION OF DOWNSTREAM MIGRATING ANADROMOUS FISH

David L. Koch, 2520 Sagittarius Dr., Reno, Nev. 89509

Filed Nov. 6, 1981, Ser. No. 318,992
Int. Cl.[3] E02B 8/08
U.S. Cl. 119—3 20 Claims



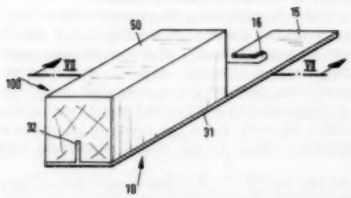
11. An apparatus for transporting downstream migrating fish past hydroelectric generating facilities comprising; an artificial stream current creating means including conduit means and water jets located in the reservoir of a hydroelectric facility water storage dam; a water transporting means extending over or around said generating facilities; means for directing and attracting downwardly migrating fish into said conduit means; diverting means for diverting said artificial stream into said conduit means; said water transporting means bypassing said dam to a terminating point at the tailrace located in the stream below said generating facility.

4,437,432

BIRD-FEEDING MEMBER

Fritz H. Immeyer, Hamburg, and Michael Wesche, Reinbek, both of Fed. Rep. of Germany, assignors to Dr. Immeyer GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 15, 1981, Ser. No. 302,385
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034875; Aug. 25, 1981, 8124828[U]
Int. Cl.[3] A01K 39/01
U.S. Cl. 119—18 6 Claims



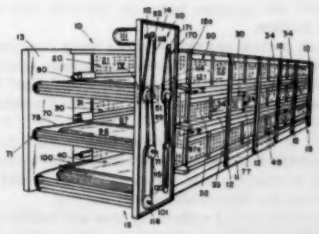
1. A bird-feeding member comprising a supporting and retaining member and a quantity of birdseed which is retained thereon and held together by a bonding agent, means for attaching said bird-feeding member into the bars of a birdcage wherein the bird-feeding member comprises a supporting and retaining member of an elongated strip-shaped blank with a first end and a second end spaced apart in the elongated direction thereof with said first end being T-shaped, said blank having a first folding line extending between the first and second ends and dividing said blank into co-extensive elongated first and second parts, said second part having a second folding line extending from said second end toward and spaced from said first end, said second folding line dividing said second part into elongated co-extensive first and second sub-parts with said first sub-part extending between said first and second folding lines and said second sub-part spaced from said first folding line by said first sub-part, said first sub-part is folded over along said first folding line into contact with said first part and said second sub-part is folded along said second folding line so that it extends perpendicularly to said first sub-part and said first part forming a web extending in the elongated direction of said blank and spaced inwardly from the edges of said first part extending in the elongated direction thereof, a block-like birdseed member being retained on a contact surface formed by said first part and said first sub-part of said supporting and retaining member by means of the bonding agent holding the seeds together with said web formed by said second sub-part extending into said birdseed member, said block-like birdseed member having a first surface in contact with said supporting and retaining member, a second surface opposite said first surface and facing outwardly from said supporting and retaining member, and side surfaces extending between said first and second surfaces, said web formed by said second sub-part extending outwardly from said first sub-part for a dimension equal approximately to half the dimension of said birdseed member between said first and second surfaces thereof, at least one web reinforcing and support strap secured to said web formed by said second sub-part along said second folding line and with said web extending perpendicularly to said first part said web reinforcing and support strap extends from said web into contact with said first part of said supporting and retaining member, and said block-like birdseed member has a first end spaced in the elongated direction of said blank from the first end thereof and a second end adjacent the second end of said blank so that each of said first and second parts of said blank has a portion extending in the elongated direction of said blank between said birdseed member and said first end of said blank which is free of said birdseed member, said means for attaching comprises each of said first and second parts having a separate slot-shaping latching eyelet which is formed by a first slot-shaped portion extending at an oblique angle to said first and second folding lines and toward said first end of said blank from the lateral edge of the corresponding one of said first and second parts extending in the elongated direction thereof and a second slot-shaped portion extending from said first slot-shaped portion in the corresponding one of said first and second parts toward the first end of said blank with said second slot-shaped portion centreed in the corresponding one of said first and second parts and disposed in generally parallel relation with the elongated direction of said blank, and the end of said second slot-shaped portion spaced from said first slot-shaped portion being spaced from the first end of said blank.

4,437,433

POULTRY BROILER CAGE

W. A. J. Nijhof, Hattem, Netherlands, assignor to U. S. Industries, Inc., Stamford, Conn.

Filed Jan. 26, 1982, Ser. No. 342,889
Int. Cl.[3] A01K 31/00, 31/04
U.S. Cl. 119—18 24 Claims



1. A confinement area for rearing poultry including opposed sides and a floor movable longitudinally with respect to said

confinement area to load poultry into and unload poultry out of said confinement area, wherein the improvement comprises:

first and second generally horizontal support rails secured generally opposite one another to said opposed sides of said confinement area;

first and second tension pulling means extending along said first and second rails, respectively;

means for moving said first and second tension means longitudinally with respect to said rails;

means for guiding said tension pulling means on a path along said rails, said guide means including a plurality of support bars each extending between and secured to said first and second tension pulling means; and

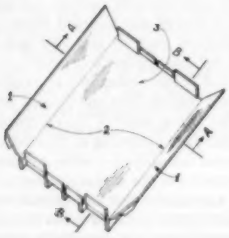
a flexible poultry-supporting floor material supported in trampoline-like fashion between at least one of said support bars and said tension pulling means, whereby movement of said tension pulling means moves the floor material and further whereby longitudinal pulling forces are borne by said tension pulling means rather than said flexible floor.

4,437,434

REMOVABLE POULTRY NEST BOTTOMS OF VARIABLE WIDTHS

Walter G. Davis, Hall County, Ga., assignor to NesTier Corporation, Cincinnati, Ohio

Filed May 11, 1983, Ser. No. 493,652
Int. Cl.³ A01K *31/16*
U.S. Cl. 119—45 R **6 Claims**



1. A removable poultry nest bottom of variable width, to be selectively placed within poultry nests of various sizes comprising:

said nest bottom consisting entirely of synthetic resin molded in one piece;

a rigid bottom portion of rectangular shape having two opposite sides and two opposite ends;

at least two rigid side portions;

integral sheet material hinge means respectively connecting said side portions to said sides of said bottom portion so that said bottom portion and side portions lie in a common plane in the normal unstressed condition of said hinges, with said side portions being on opposite sides of said bottom portion;

said bottom portion and side portions being constructed of planar sheets having a thickness substantially greater than the thickness of said hinge means, and further having coplanar flat top surfaces in the unstressed normal position;

a plurality of rib means extending downwardly from the bottom surface of said side portions and said bottom portion for reinforcing said sheets and spacing said sheets away from the support surfaces of the nest;

said hinge means being sufficiently thin and flexible to permit resilient movement of said side portions between the normal position and a position extending upwardly at right angles to said bottom portion selectively without material fatigue; and

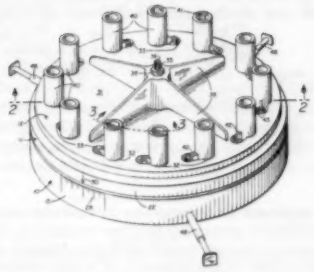
said hinges being continuous throughout the length of said side portions and bottom portion.

4,437,435

AUTOMATIC ANIMAL FEEDER

Sheldon D. Schule, 1313 Boston, Clarkston, Wash. 99403

Filed Feb. 28, 1983, Ser. No. 470,210
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51.13 **4 Claims**



1. An automatic device to periodically feed animals without human intervention, comprising, in combination:

A base having a planar circular bottom structurally carrying an upstanding side wall about its periphery and having means to support a storage disc thereabove and a disbursement slot defined therethrough inwardly adjacent its periphery;

a medial adjustment element, having an annular body with external diameter slightly less than the internal diameter of the vertical side wall of the body, pivotably carried on the bottom of the base and defining a disbursement slot therethrough inwardly adjacent the periphery of the annular body, said disbursement slot being no larger than the disbursement slot defined in the base and pivotable thereover;

means cooperatively communicating between the base and the medial adjustment element to limit the pivotable motion therebetween to substantially the arcuate distance between two sucessive feed reservoirs;

a flat, circular storage disc, supported on the body and carried a spaced distance above the medial adjustment element, having a plurality of spaced storage reservoirs arcuately arrayed inwardly adjacent its periphery and communicating through the storage disc, each reservoir having associated normally closed gravity activated valving means openable when the reservoir passes over the disbursement orifice in the medial adjustment element; and

motor means carried by the base rotate the storage disc relative thereto at predetermined speed.

4,437,436

ANTIKNOCK ADDITIVE COMPOSITIONS AND UNLEADED GASOLINE CONTAINING SAME

L. B. Graiff, Houston, Tex., and John L. Laity, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 4, 1982, Ser. No. 432,587
Int. Cl.³ F02B *47/04*
U.S. Cl. 123—1 A **5 Claims**

1. An improved method of operating a spark ignition internal combustion engine which comprises burning in said engine an unleaded gasoline which has been transported to the engine through a gasoline distribution system which includes rusted steel lines and/or has been stored in an automobile fuel tank which includes a terneplate internal surface coating, said unleaded gasoline containing as a primary antiknock compound

from about 0.005 to about 0.1 gram manganese per gallon as methylcyclopentadienyl manganese tricarbonyl (MMT) and containing as a co-antiknock compound which is unreactive with rusted steel or terneplate from 5 to about 60 moles of benzoylacetone or methyl benzoylacetone per mole of manganese and optionally a suitable corrosion inhibitor.

4,437,437

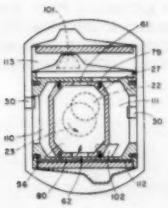
DUAL-EXPANSION INTERNAL COMBUSTION CYCLE AND ENGINE

Frederick L. Erickson, 2610 Bosworth Dr., Fort Wayne, Ind. 46805

Division of Ser. No. 180,135, Aug. 21, 1980, Pat. No. 4,325,331, and a continuation-in-part of Ser. No. 959,795, Nov. 13, 1978, abandoned. This application Mar. 22, 1982, Ser. No. 360,221

Int. Cl.³ F02B *59/00*

U.S. Cl. 123—42 **53 Claims**



1. An internal combustion engine, comprising in combination

(a) a central power block defining between forward and after end plates and fluid-tight engine volume;

(b) a main crankshaft arranged to deliver mechanical power;

(c) first chamber defining means movable within said engine volume to define opposed second and fourth chambers of variable and complementary volumes;

(d) second chamber defining means reciprocally movable within said first chamber defining means to define opposed first and third chambers of variable and complementary volumes, said second chamber defining means being connected to said main crankshaft wherein motion of said second chamber defining means is orbital with respect to said main crankshaft and providing in its motion consequent motion of said first chamber defining means;

(e) first porting means providing fluid communication between said first and second chambers, the flow of fluid through said first porting means being controlled by the movement of said second chamber defining means;

(f) second porting means providing fluid communication between said second chamber and the atmosphere, the flow of fluid through said second porting means being controlled at least in part by the movement of said second chamber defining means;

(g) fuel/air mixture supply means to provide a fuel/air mixture to said first chamber;

(h) induction porting means to control the flow of said fuel/air mixture from said supply means into said first chamber, said induction porting means having a configuration and location in said after engine plate such that it is open by the motion of said first chamber defining means and closed by the motion of said second chamber defining means; and

(i) ignition means arranged to ignite said fuel/air mixture in said first chamber.

4,437,438

RECIPROCATING PISTON ENGINE

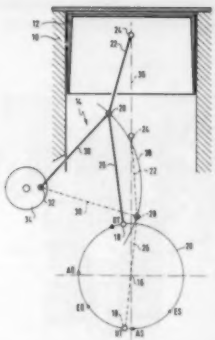
Gerhard Mederer, Kellerstrasse 7, Allersberg/BDR, Fed. Rep. of Germany

Filed Aug. 10, 1981, Ser. No. 291,292

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030615

Int. Cl.³ F02B *75/32*

U.S. Cl. 123—48 B **11 Claims**



1. A reciprocating piston engine comprising at least one cylinder and a piston movable back and forth therein along a cylinder axis, which piston is connected to a crank shaft, rotatable about a crank shaft axis, through a linkage including a first connecting rod pivotally connected to said piston by a piston-sided connecting rod bearing, and a second connecting rod pivotally connected to said crank shaft by a crank shaft-sided connecting rod bearing wherein said second connecting rod is longer in length than said first connecting rod, and a swinging lever pivotally support at one end for movement about a pivot axis essentially parallel to said crank shaft axis and at its other end hingedly connected to both of said connecting rods through a common joint, said two connecting rods having a total length being larger than a distance between said piston-sided connecting rod bearing and a path of said crank shaft-sided connecting rod bearing when said piston is in its top dead center position, and said pivot axis having a location and said swinging lever having a length being so chosen that at the top dead center position of said piston said common joint is displaced a substantial distance from said cylinder axis and is located on a side of said cylinder axis same as said pivot axis of said swinging lever and so that during initial portion of movement of said piston away from its top dead center position said common joint approaches said cylinder axis and so that during a subsequent portion of the movement of said piston away from its top dead center position said common joint crosses said cylinder axis so as to then be located on the opposite side of said cylinder axis from said pivot axis of said swinging lever.

4,437,439

VALVE TAPPET

Walter Speil, Ingolstadt, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Division of Ser. No. 228,176, Jan. 26, 1981. This application Jun. 22, 1982, Ser. No. 390,813

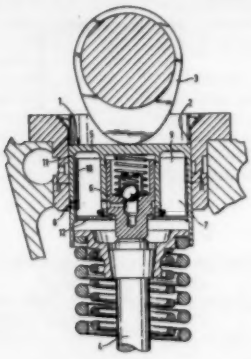
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006644

Int. Cl.³ F01L *1/24*

U.S. Cl. 123—90.56 **11 Claims**

1. A valve tappet for internal combustion engines with an overhead cam shaft moveably mounted in a sliding guide directly between a cam and a valve stem and which is designed as an automatic play compensating element comprising an outer part and an inner part guided in one another for longitu-

dinal displacement and enclosing between them a pressure chamber connected by a non-return valve to an oil storage chamber with an inner surface charged with oil from a lubricating system of an engine, the outer part cooperates with the sliding guide and the cam and the inner part cooperates with the valve stem, the oil stroage chamber with an upper portion and a lower portion being arranged inside the outer part so that it extends exclusively in the radial direction around the inner



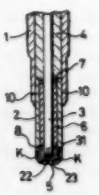
part and having in its lower portion an oil feed bore and at least one oil transfer bore to the pressure chamber, an oil carrying passage adjoining the oil feed bore inside the oil storage chamber opening freely into the oil storage chamber in the upper portion thereof, the oil carrying passage being formed by the inner surface of an outer wall of the oil storage chamber and by a sheet metal element corresponding with the said inner surface.

4,437,440

AUXILIARY COMBUSTION CHAMBER PREHEATING DEVICE

Shin Suzuki, and Toshihiko Sato, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 20, 1979, Ser. No. 50,410
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—145 A **7 Claims**



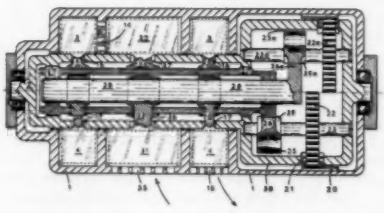
1. An auxiliary combustion chamber preheating device having a glow plug for a diesel engine, comprising:
- a metal shell threadedly mountable on the engine;
- a center electrode having a rod-like configuration;
- a tubular heat generating element having an open end and a closed end, said element made of nonmetallic resistance material and inserted into and connected to the metal shell at the open end thereof;
- electrical connecting means for electrically connecting a lower end surface of the center electrode and an inner wall portion of the closed end portion of the heat generating element;
- an electrical conductive layer on an outer wall portion of the heat generating element contacting said metal shell;
- said electrical connecting means includes carbon powders and a space defined by the center electrode and said connecting means within the tubular heat generating element is filled with non-oxidizing electrical insulative material selected from the group consisting of silicon nitride (Si_3N_4), boron nitride (BN) or aluminum nitride (AlN); and
- said electrical connecting means further includes a ceramic sleeve member disposed on the bottom wall of the closed end of the heat generating element.

4,437,441

ROTARY ALTERNATING PISTON GAS GENERATOR

Claude C. F. Menioux, Nogent sur Marne, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Feb. 3, 1981, Ser. No. 231,105
Claims priority, application France, Feb. 6, 1980, 80 02540
Int. Cl.³ F02B *53/08*
U.S. Cl. 123—213 **7 Claims**



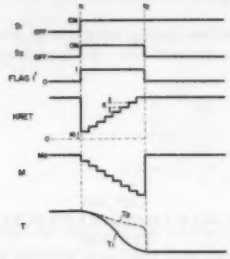
1. A variable volume gas generator for charging a self-contained power turbine having heat engines for generating hot compressed gases comprising:
- a first and second module each forming a heat motor for the production of the hot compresed gases;
- a third module connected to said first and second modules and which forms an air compressor to charge the heat engines, said modules comprising a fixed housing delimiting an annular space;
- a plurality of pistons which rotate in the same direction in said annular space, wherein said pistons are mounted in each module;
- first and second rods diametrically connecting said pistons in pairs;
- a first and second shaft which are coaxial wherein the first rod of each module is mounted on the first shaft and the second rod of each module is mounted on the second shaft and wherein the air compressor module operates on a two stroke cycle and the first and second gas generator modules, which are charged with compressed air from the compressor, operate on a four stroke cycle; and
- a rotary crown having a plurality of ports through which the rods are disposed, wherein in each module the annular space in which the pistons move is delimited by the housing and the rotary crown, and which provide the angle of clearance for the rods for the pistons to advance and recede, and a transmission mechanism wherein said crown is attached by said transmission mechanism to the shafts and wherein the shafts are in integral part of the piston rods.

4,437,442

AUTOMOTIVE VEHICLE ENGINE CONTROL SYSTEM

Hiroshi Yamaguchi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 13, 1981, Ser. No. 234,582
Claims priority, application Japan, Feb. 15, 1980, 55-16610
Int. Cl.³ F02D 37/02
U.S. Cl. 123—417 5 Claims



1. An automotive engine control system for controlling fuel supply and ignition spark timing of an engine having a means for cutting off the fuel supply during engine operation, comprising:

(a) a throttle valve position detecting means for detecting the position of a throttle valve and operative to indicate a closed state of said throttle valve;

(b) an engine speed detecting means for detecting engine speed;

(c) an engine cooling water temperature detecting means for detecting engine cooling water temperature;

(d) a spark advance angle calculating means for calculating an optimum spark advance angle of said ignition spark timing with respect to a top dead center position of each piston of said engine from said engine speed detecting means while said throttle valve position detecting means detects the closed state of the throttle valve;

(e) a fuel supply cutoff delay decision means for deciding to delay actual fuel supply cutoff when (a) said speed detecting means detects the engine speed exceeds a first predetermined engine speed characteristic based upon the cooling water temperature detected by said temperature detecting means, and (b) said position detecting means detects a change in the throttle valve position from an open state to a closed state, said first predetermined engine speed characteristic being higher than a second predetermined engine speed characteristic wherein the fuel supply is resumed;

(f) a delay executing means responsive to said delay decision means for providing a predetermined delay prior to actual fuel cutoff; and

(g) a spark advance angle retarding means operative to retard the optimum spark advance angle calculated by said calculating means while said delay executing means executes the predetermined delay of the actual fuel cutoff.

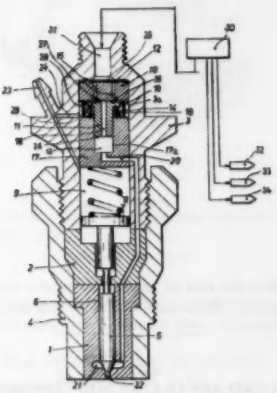
4,437,443

FUEL INJECTION DEVICE

Peter Hofbauer, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,884
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048347
Int. Cl.³ F02M 39/00, 47/02
U.S. Cl. 123—446 9 Claims

1. In a fuel injection system including at least one injection pump delivering fuel at a medium delivery pressure, at least one fuel injection valve associated with a respective engine cylinder and having a fuel injection opening for injecting fuel into its associated cylinder and a conduit leading to the injection opening, and pressure booster means associated with said valve and connected between said conduit and the pump for boosting the pressure at the opening from the medium pressure produced by the pump to a higher pressure required for fuel injection via the opening, the pressure booster means associated with said valve being composed of a stepped piston having oppositely oriented end faces of unlike effective area, a housing in which the piston is slidably mounted and presenting a first working chamber associated with the larger end face of the piston and communicating with the pump, and a second



working chamber associated with the smaller end face of the piston and communicating with the associated conduit, and spring means biasing the piston in one direction in the housing, the improvement wherein: said piston comprises a first piston segment presenting the larger piston end face and a second piston segment separate from said first segment and presenting the smaller piston end face; said second segment comprises valve means for selectively blocking communication between said conduit and the pump; and said spring means comprise two springs each acting separately on a respective one of said segments.

4,437,444

FUEL INJECTION PUMP FOR A DIESEL ENGINE

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company Ltd., Kanagawa, Japan

Filed Dec. 16, 1981, Ser. No. 331,328
Claims priority, application Japan, Dec. 19, 1980, 55-180008; Mar. 5, 1981, 56-31680; Mar. 5, 1981, 56-31681
Int. Cl.³ F02M 59/00
U.S. Cl. 123—458 6 Claims

1. A fuel injection pump for a diesel engine, comprising:

(a) a fuel tank for containing fuel;

(b) a housing defining a chamber;

(c) a fuel passage interconnecting the fuel tank and the chamber;

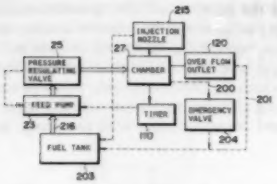
(d) a feed pump located along the fuel passage for driving fuel from the fuel tank toward the chamber;

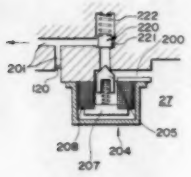
(e) a plunger pump connected to the chamber for supplying fuel from the chamber to the engine;

(f) an overflow passage having one end connected to the chamber and the other end connected to the fuel tank for returning a part of fuel from the chamber to the fuel tank;

(g) a fuel return passage having one end connected to the chamber and the other end connected to the fuel tank for returning a part of fuel from the chamber to the fuel tank; and

(h) an emergency valve interposed in the fuel return passage for selectively closing and opening the fuel return passage





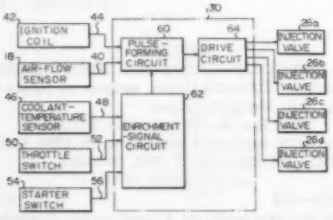
to reduce the rate of fuel supply to the engine when the emergency valve opens the fuel return passage.

4,437,445

METHOD AND APPARATUS FOR CONTROLLING THE FUEL FEEDING RATE OF AN INTERNAL COMBUSTION ENGINE

Hiroshi Takahashi; Yukio Suzuki; Masashi Matsuo; Hironobu Ono, all of Toyota; Shuzo Yoshida, Anjo; Kazuo Ueda, Kariya, and Motoharu Sueishi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Aug. 12, 1982, Ser. No. 407,562
Claims priority, application Japan, Aug. 13, 1981, 56-125984
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—491 **9 Claims**



1. A method for controlling the fuel-feeding rate of an internal combustion engine having a throttle valve, comprising the steps of:

detecting the warm-up condition of the engine to generate a first electrical signal which indicates the detected warm-up condition;

detecting whether the engine is starting or is not starting to generate a second electrical signal which indicates the detected result;

detecting whether the throttle valve is in the idle position or is not in the idle position to generate a third electrical signal which indicates the detected results;

calculating, in response to said first electrical signal, a first additional increment of the fuel-feeding rate of the engine, said first additional increment being determined depending upon the detected warm-up condition;

calculating, in response to said second and third electrical signals, a second additional increment of the fuel-feeding rate of the engine, said second additional increment, after starting of the engine, being decreased to zero with the lapse of time at a controllable speed of decrease, and said speed of decrease of the second additional increment being changed depending upon the third electrical signal; and

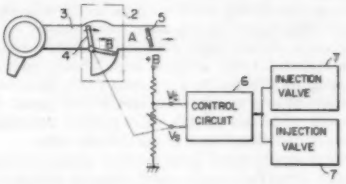
correcting the fuel-feeding rate of the engine in accordance with said calculated first and second additional increments.

4,437,446

ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM

Shigenori Isomura; Akio Kobayashi; Katsushi Kato, all of Kariya; Ichiro Kowada, and Sachio Nishii, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 155,385, Jun. 2, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 358,923
Claims priority, application Japan, Jun. 27, 1979, 54-81663
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—492 **3 Claims**



1. An electronically controlled fuel injection system for internal combustion engines comprising:

an air flow sensor including a potentiometer for detecting an amount of air flow to an engine at a position upstream of a throttle valve disposed in an intake pipe of said engine and generating a corresponding output voltage;

control means including a controller having fuel injection amount compensating means responsive to said output voltage of said sensor to generate a pulse signal; and fuel injection valve means responsive to said pulse signal from said controller to inject said engine with an amount of fuel corresponding to a pulse width of said pulse signal; and

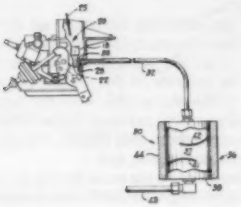
a fuel enrichment circuit responsive to said output signal of said air flow sensor for feeding, when said amount of air flow changes in a direction to decrease, a signal commanding an increase in fuel amount which is proportional to the rate of said change to said compensating means, said fuel enrichment circuit including a delay circuit comprising a resistor and a capacitor for generating an output voltage indicative of a change in said sensor output voltage with a predetermined delay, a buffer amplifier for delivery said delay circuit output voltage, and a differential amplifier circuit for receiving and differentially amplifying said air flow sensor output voltage and buffer amplifier output voltage, whereby the rate of increase in said fuel injection amount is proportional to said difference between the sensor output voltage and the buffer amplifier output voltage.

4,437,447

EXHAUST RECYCLE TO CARBURETOR OF AN INTERNAL COMBUSTION ENGINE

Charles R. Johnson, 543 Robinhood Dr., Aurora, Ohio 44202

Filed Sep. 23, 1982, Ser. No. 421,896
Int. Cl.³ F02M 25/06
U.S. Cl. 123—568 6 Claims



1. In an internal combustion engine having an exhaust manifold, and a float-controlled down-draft carburetor including a booster venturi means for injecting gasoline into the carburetor wherein said booster venturi is positioned above the throttle plate of the carburetor, the improvement comprising,

(a) an attenuator means which places said exhaust manifold in unvalved but restricted open fluid communication with said exhaust manifold, said attenuator means comprising,

(i) an attenuator chamber, and

(ii) baffle means within said chamber to attenuate the velocity and lower the pressure of exhaust gases in said exhaust manifold,

(b) intake conduit means of predetermined diameter to place said chamber in open fluid communication with said exhaust manifold, and,

(c) supply conduit means of predetermined diameter placing said chamber in open fluid communication with said carburetor, the outlet of said supply conduit being positioned directly laterally opposite from said booster venturi so as to heat it by directly impinging recycled exhaust gases thereupon, the amount of said recycled gases to the carburetor being greater than 2 percent but less than 10 percent by volume of exhaust gases generated by said engine.

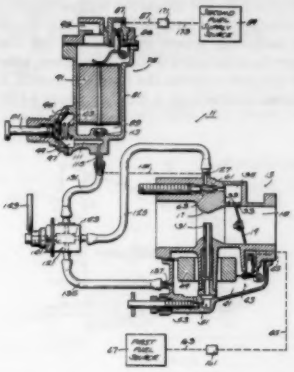
4,437,448

DUAL FUEL SUPPLY SYSTEM

Henry C. Billingsley, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 175,348, Aug. 4, 1980, Pat. No. 4,375,795.
This application Dec. 20, 1982, Ser. No. 450,901
Int. Cl.³ F02B 7/02
U.S. Cl. 123—577 5 Claims

1. A fuel supply system comprising a carburetor including an air/fuel induction passage including a main supply jet and a secondary orifice, a first fuel supply including an auxiliary outlet, communicating with said main jet, communicable with a source of a first fuel, and operable to supply the first fuel to said main jet and to said auxiliary outlet, a second fuel supply communicable with a source of a second fuel, and including an outlet, and a control valve including a valve chamber which is closed to the atmosphere and which is connected to said secondary orifice, to said auxiliary outlet of said first fuel supply, and to said outlet of said second fuel supply, said control valve also including a valve member movable between a first position communicating said secondary orifice with said outlet and disconnecting said secondary orifice from said auxiliary outlet and a second position communicating said secondary orifice



with said auxiliary outlet and disconnecting said secondary orifice from said outlet.

4,437,449

ARROW PROJECTING HANDBOW

Michael P. Attanasio, 1156 Glenwood Blvd., Schenectady, N.Y. 12308

Filed Jul. 8, 1981, Ser. No. 281,462
Int. Cl.³ F41B 7/00
U.S. Cl. 124—22 12 Claims

1. An improved handbow comprising:

(a) a frame;

(b) a handle extending laterally from the frame when the frame is in an upright position;

(c) an opening in the frame through which an arrow may be supported and shot;

(d) an elastic bowstring secured at its opposite ends to the frame;

(e) a pair of spaced stops extending rearwardly of the frame for terminating the forward movement of the bowstring to provide a uniform application of force to an arrow upon its release from the bowstring the stops being disposed substantially vertical when the frame is in the upright position; and

(f) one of the stops including means for engaging the arm of an archer to stabilize the handbow during shooting.

4,437,450

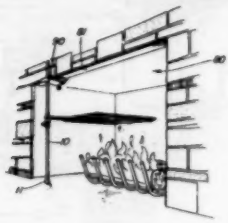
PORTABLE COOKING GRILL

William L. Connelly, 463 Kenwood Ave., Ottawa, Ontario, Canada K2A 0K8

Filed Sep. 7, 1982, Ser. No. 415,326
Int. Cl.³ F24B 3/00
U.S. Cl. 126—30 2 Claims

1. A portable cooking stand for use in an open fireplace comprising:

(a) a post;
(b) at least one grill assembly swingably and slidably mounted on said post and projecting laterally therefrom;
(c) adjustably movable means for supporting the grill assembly at any position longitudinally along the post; and
(d) post anchoring means for securing the cooking stand adjacent the front open wall of a fireplace, when the lower end of the post rests on the fireplace hearth, said anchoring means comprising a pair of plates each having an



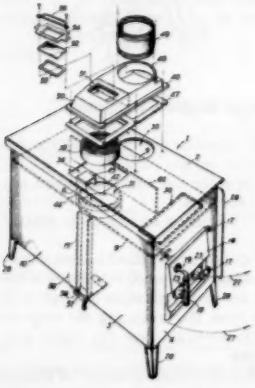
aperture therein adjacent one end thereof slidably to receive the post, an uppermost one of said plates having a hooked end portion curving around a corresponding end portion of the lowermost plate and bolt means threaded through the lowermost plate and abutting the lower surface of the uppermost plate for pressing the uppermost plate against the undersurface of the lintel extending across the fireplace opening at the upper portion thereof to thereby anchor the cooking stand in position.

4,437,451

STOVE WITH CATALYTIC COMBUSTOR AND BYPASS

Charles F. Wysong, Birmingham, Ala., assignor to Atlanta Stove Works, Inc., Atlanta, Ga.

Filed Aug. 17, 1981, Ser. No. 293,253
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 **3 Claims**



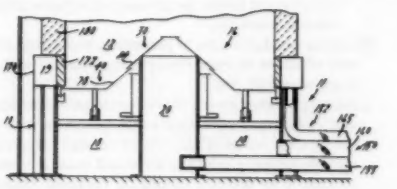
3. A stove comprising:
(a) a firebox forming a combustion chamber and having first and second openings to the exterior of the firebox;
(b) a second chamber having an opening for connection to a flue and communicating with the combustion chamber through:
(i) a smoke relief opening located proximate to the first opening;
(ii) a sleeve; and
(iii) a bypass communicating with regions at each end of the sleeve;
(c) A monolithic ceramic substrate catalytic combustor mounted in a sleeve;
(d) a loading door on the firebox moveable between open and closed positions relative to the first opening in the firebox and having openings to provide a primary supply of air to the combustion chamber;
(e) a smoke relief door coupled to the loading door for closing the smoke relief opening when the loading door is closed;
(f) a means for supplying secondary air to the combustion chamber near the catalytic combustor, comprising a first tube and a second tube, the first tube communicating between the exterior of the firebox and the combustion chamber within the second tube, the second tube being substantially vertical and open to the combustion chamber at the top and bottom ends thereof, the top end being near the catalytic combustor; and
(g) a turret mounted on the stove having an opening covered by a sight glass disposed above and in registration with the catalytic combustor and spaced apart from the second chamber.

4,437,452

ROTARY CONTINUOUS ASH DISCHARGE STOKER

David C. Reschly, Monroe, Mich., assignor to Detroit Stoker Company, Monroe, Mich.

Continuation of Ser. No. 62,327, Jul. 31, 1979, abandoned. This application Apr. 11, 1983, Ser. No. 482,015
Int. Cl.³ F23H 9/00
U.S. Cl. 126—182 **34 Claims**



1. In a rotary stoker or the like having an inner wall forming a furnace combustion chamber, a grate on which burning fuel is supported and means to admit air from below the grate to said fuel, an improved air supply system comprising:
a central stationary section and an outer rotating ring forming said grate and defining a continuous fuel supporting surface across said central stationary section and outer rotating ring;
at least two separate air planums located under said grate to supply pressurized air to the fuel continuously throughout the extent of travel of said fuel along the continuous fuel supporting surface, said grate forming the upper wall of each said separate air plenum;
air supply means to supply pressurized air to said plenums;
means to separately control the air pressure supplied to each air plenum; and
means for sealing the outer periphery of said grate along said inner wall.

4,437,453

PLASTIC PIPE HEATER

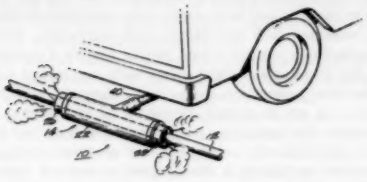
Eugene A. Temple, 1492 Glencoe Ave., Highland Park, Ill. 60035, and Norman F. Pestlin, 6870 W. 176th Pl., Tinley Park, Ill. 60477

Filed Dec. 27, 1982, Ser. No. 453,485
Int. Cl.³ F23C 5/00
U.S. Cl. 126—271.2 R **7 Claims**

1. A device for heating plastic pipe comprising
an outer tubular member;
an inner tubular member mounted inside and spaced from

said outer tubular member, said inner tubular member having a plurality of perforations therein and forming an opening which extends completely through the device for inserting therethrough the plastic pipe to be heated;

end cap means to connect the ends of said inner and outer tubular members to thereby provide a closed annular



chamber between said inner and outer tubular members; and

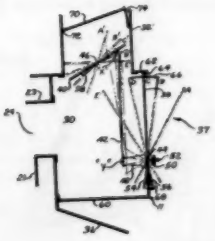
inlet conduit means adapted for connection to a source of heated air, said inlet conduit means communicating with said closed annular chamber between said inner and outer tubular members.

4,437,454

MECHANICAL DRAFT CONTROLLER WITH VENT DAMPER

Thomas E. Hayes, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 22, 1982, Ser. No. 360,166
Int. Cl.³ F23N 3/06
U.S. Cl. 126—293 **16 Claims**



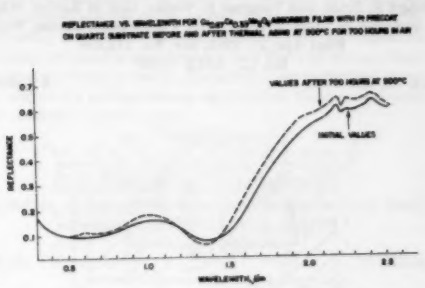
14. In a fuel burning heating appliance having a firebox, a flue and a draft hood coupling said firebox to said flue and having an aperture in a wall thereof, a method for maintaining an optimum draft value in said draft hood for supporting combustion in said firebox while reducing draft hood heat loss, said method comprising: closing said aperture over a predetermined range of normal operating draft values, said range defined by lower and upper draft value limits, and thereby preventing the introduction of ambient air into said draft hood; opening said aperture when said draft value is outside of said predetermined range; substantially opening said flue when said draft value is less than said lower draft value limit or substantially closing said flue when said draft value exceeds said upper draft value limit; and selectively opening and closing said flue downstream from said aperture over the predetermined range of normal operating draft values in response to changes therein, wherein said flue is more open when said heating appliance is operating at said lower draft value limit than when operating at said upper draft value limit.

4,437,455

STABILIZATION OF SOLAR FILMS AGAINST HI TEMPERATURE DEACTIVATION

Clinton F. Jefferson, Millburn, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed May 3, 1982, Ser. No. 374,448
Int. Cl.³ B32B 5/16
U.S. Cl. 126—417 **16 Claims**



1. A solar energy collector comprising, in combination

(a) a substrate component selected from the group consisting of quartz, silicate glass, and a stainless steel;

(b) a solar absorptive layer consisting essentially of an oxide mixture of copper, cobalt and manganese; over

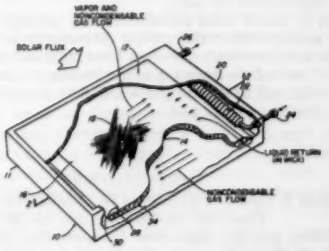
(c) an interlayer comprising platinum in contact with said solar absorptive layer and said substrate.

4,437,456

HEAT COLLECTOR

Michael A. Merrigan, Santa Cruz, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1981, Ser. No. 278,288
Int. Cl.³ F24J 3/02
U.S. Cl. 126—433 **13 Claims**



10. A method of collecting heat energy comprising:

(a) allowing heat energy to evaporate a first liquid from a wick means located within a sealed housing in the presence of a noncondensable gas, the density of said noncondensable gas being greater than the density of a mixture of vapor of said first liquid and said noncondensable gas so that said mixture rises;

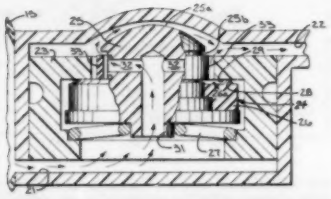
(b) condensing said vapor on a condenser means so as to recover said first liquid on said wick means and so as to provide heat to a second liquid located within said condenser means;

(c) allowing said noncondesable gas to continue its motion along a path which is separate from substantially all of said first liquid; and

(d) allowing said noncondensable gas to merge with vapor of said first liquid in the space adjacent to said wick means.

11. A method according to claim 10 wherein said heat energy is solar energy and including also the step of recovering heat from said second liquid.

4,437,457
ARTIFICIAL SPHINCTER WITH IMPROVED PRESSURE CONTROL VALVE
Robert E. Trick, and Vaughan B. Weeks, both of Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.
Filed Apr. 27, 1982, Ser. No. 372,436
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R **6 Claims**



5. An artificial sphincter comprising an inflatable balloon for closing a body passage, a pump for transferring inflating fluid to the balloon to pressurize and inflate it to collapse the body passage, and a pressure control valve for controlling the pressure in the balloon, said pressure control valve comprising:

(a) a valve jacket having an inlet and an outlet, said inlet communicating with the pump, and the outlet communicating with the inflatable balloon;

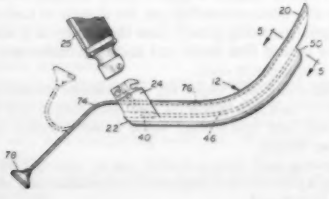
(b) a valve housing positioned in said jacket, said housing having an open top and bottom and an inwardly directed shoulder partially closing said top;

(c) a poppet mounted in said housing between the inlet and the outlet; said poppet having an upwardly extending stem and a base with a sealing edge mounted on the top of said base, said poppet also having an internal passage extending from an inlet through the base and to an outlet in the side wall of the stem;

(d) an elastic band circumferentially positioned about the stem and removably closing the outlet of the passage; and

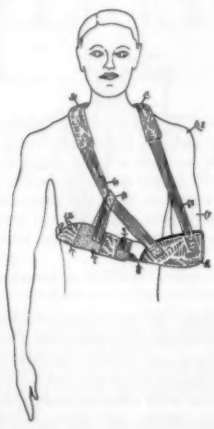
(e) yieldable means exerting a force upon said poppet urging it toward the open top of the housing so that the sealing edge will be in sealing contract with the underside of the shoulder closing said valve.

4,437,458
LARYNGOSCOPE
Michael S. Upsher, 2957 Adeline Dr., Burlingame, Calif. 94010
Filed Nov. 25, 1981, Ser. No. 324,887
Claims priority, application European Pat. Off., Nov. 27, 1980, 80 107427.9
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—11 **13 Claims**



1. A laryngoscope having a handle including an electrical power source, a blade having a forwardmost end and a rearwardmost end, the latter defining a mounting base; and means forming part of said handle and part of said mounting base for disengagably connecting said base with said handle, the improvement comprising: a light source carried by said handle; a light guide carried by said blade and extending from its base to its forwardmost end; and a cooperating arrangement forming part of said handle and part of said base for causing said power source to energize said light source when said blade is disengagably connected with said handle, said cooperating arrangement including a passage in said handle, electrical connection means for coupling said light source with said power source, said electrical connection means being disposed within said passage so as not to extend outwardly of said passage, said arrangement also including a projecting member carried by the base of said blade for engaging said electrical connection means when said blade is disengagably connected with said handle in order to cause said power source to energize said light source, said blade including said projection being one type of laryngoscope blade and said handle including an arrangement separate from said last-mentioned arrangement for cooperating with a second, different type of blade which carries its own light source such that said second blade is disengagably connectable with said handle such that said second arrangement causes the power source in said handle to actuate the light source carried by said second blade while not causing said power source to actuate the light source carried by said handle.

4,437,459
HEMI-SLING
Deborah Slavetskas, 5 Laine Ct., Appalachin, N.Y. 13732
Filed Sep. 29, 1982, Ser. No. 428,181
Int. Cl.³ A61F *5/40, 13/00*
U.S. Cl. 128—94 **9 Claims**



1. A sling for supporting the hand, shoulder, elbow and upper and lower arm of a patient comprising:

(a) elbow containing means for enclosing the elbow of the arm to be supported, made of flexible material;

(b) first strap means having first and second ends and a flexible middle portion therebetween, attached at both ends to the elbow containing means;

(c) second strap means, having first and second ends and a flexible middle portion therebetween, attached at the first end to the elbow containing means;

(d) third strap means, having two ends and a flexible middle portion therebetween, the middle portion being attached to the middle portion of the first strap means at a point

along the length of the middle portion of the first strap means, the point of attachment being chosen to fall in mid-chest of the patient;

(e) The length of the first strap means being chosen such that the first strap means can comfortably pass from its first end at the elbow containing means with the patient's elbow therein, across approximately the middle of the patient's chest, around the patient's neck and shoulder on the side opposite the arm to be supported, and down across the patient's shoulder blades and back to the second end at the elbow containing means;

(f) The second end of the second strap means attaching to the middle portion of the first strap means at a point located on the center line of the patient's back;

(g) The length of the second strap means being chosen such that the second strap means passes from the elbow supporting means over the patient's shoulder to the first strap means, and the patient's arm is supported by the elbow containing means, holding the upper arm in a natural position without strain on the shoulder joint;

(h) hand supporting means comprising: a body adapted to enclosing the back of the patient's hand made of flexible material, adjustable wrist strap means for securing the body at one end to the patient's wrist, palm strap means for securing the body to the patient's hand, crossing the palm of the hand across the base of the fingers; and fastening means for attaching the body to the ends of the third strap means;

(i) the ends of the third strap means being adapted to adjustably mate with the fastening means of the hand supporting means, whereby the patient's hand is supported in a natural functional position in supination, with the hand in an adjustable position higher than the elbow.

4,437,460

BREATHING APPARATUS

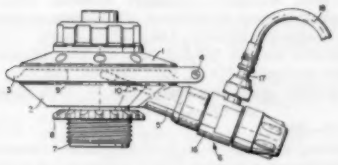
Michael H. Glynn, Basingstoke, England, assignor to Sabre Safety Limited, England

Filed Oct. 6, 1981, Ser. No. 308,993

Claims priority, application United Kingdom, Oct. 17, 1980, 8033674

Int. Cl.³ A62B 7/04

U.S. Cl. 128—204.26 **4 Claims**



1. In a single stage breathing apparatus, a demand valve comprising a valve body having a diaphragm chamber, an outlet means from said chamber for connection to a face mask, a diaphragm clamped within said chamber and being displaceable by pressure changes therein, and an inlet portion connected to said chamber comprising a plurality of body parts providing an inlet for admission of compressed breathable gas, a valve seating, a valve member urged into engagement with the valve seating, means for moving the valve member away from the seating when suction is applied to the outlet means to enable the breathable gas to pass from the inlet to the outlet means, and by-pass means enabling the breathable gas to by-pass the valve member and seating and thereby reach the outlet means to provide an emergency supply of breathable gas in the event of the valve member becoming lodged in the closed position, the by-pass means including a flow passage sized to allow a predetermined volumetric flow rate of breathable gas at a pressure within a predetermined range, a first chamber communicating with the sized flow passage and an orifice leading from the inlet to said first chamber, and a constant pressure reduction valve comprising a piston, one end of which is adapted to close said orifice leading from the inlet to said first chamber, biasing means urging the piston in a direction to open said orifice, means normally restraining the piston from movement by the biasing means but operable in an emergency to permit movement of the piston to open said orifice, another end of the piston forming a wall of a second chamber having a greater cross-sectional area than the cross-sectional area of the first chamber, and the piston having a bore therethrough communicating said first and second chambers enabling breathable gas under pressure to pass between said first and second chambers to control the pressure of breathable gas in the first chamber within the predetermined range when the constant pressure reduction valve is open.

4,437,461

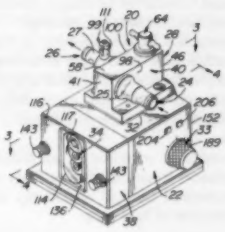
VALVE RESPIRATOR DEVICE

Mitchell H. Greenberg, 796 Sport Hill Rd., Easton, Conn. 06612

Filed Apr. 16, 1982, Ser. No. 368,934

Int. Cl.³ A61M 16/00

U.S. Cl. 128—205.24 **24 Claims**



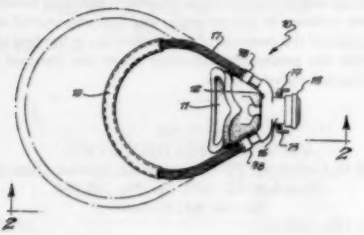
1. A valve respirator device comprising a housing having a bore extending therein, said housing also having first, second and third passage means each having one portion communicating with said bore and a second portion communicating with a first, a second and a third port, respectively, wherein said first port is adapted to be in fluid communication with a source of gas, said second port is open to the ambient atmosphere and said third port is adapted to be in fluid communication with a patient's respiratory system, movable means in the form of a readily replacable rotatable cylinder mounted in said bore having a first recess in alignment with said first and third passage means; and a second recess in alignment with said second and third passage means, both recesses being located in the cylinder's periphery and isolated from each other, for alternately establishing fluid communication, first between said first port and said third port during a portion of a rotational cycle of said cylinder when said first recess is in fluid communication with both said first passage means and said third passage means and then between said second port and said third port during a second portion of said rotational cycle during which time said second recess is in fluid communication with both said second passage means and said third passage means, such that when said first port is in fluid communication with said third port, said patient inhales the gas passing through said first port and when said second port is in fluid communication with said third port, said patient is able to exhale gas therethrough to the atmosphere, means for controlling the amount of gas passing through each of said ports, with said means for controlling the passage of gas through said second port comprising adjustable valve means, capable of being adjusted while the device is in operation to control the patient's rate of exhalation and means for regulating the rotation of said cylinder and thereby the time intervals during which said first port and said second port, respectively, are in fluid communication with said third port.

4,437,462

PNEUMATIC HEAD HARNESS

Robert E. Piljay, Alden, and Loyal G. Netteland, Holland, both of N.Y., assignors to Figgie International Inc., Willoughby, Ohio

Filed Nov. 19, 1981, Ser. No. 322,775
Int. Cl.³ A67B 18/08
U.S. Cl. 128—207 16 Claims



1. An inflatable head harness for holding a device in position on the head of a user, said harness comprising:

(a) at least one extensible tubular member in the form of a loop, said extensible tubular member including a longitudinally elastically extensible outer tube and an inflatable inner tube positioned within said outer tube, said inner tube being substantially inelastic in comparison with said outer tube; and

(b) means connectable to a source of pressurized fluid to permit the admission to and discharge from said tubular member of pressurized fluid to selectively increase and decrease the diameter of said loop.

4,437,463

SECURING DEVICE FOR TUBE INSERTABLE IN BODY CAVITY

Bernard Ackerman, Metuchen, N.J., assignor to Ackrad Laboratories, Inc., Garwood, N.J.

Filed Nov. 16, 1981, Ser. No. 321,611
Int. Cl.³ A61M 25/02
U.S. Cl. 128—207.17 10 Claims

1. A device for securing a tube extending from a body, said device comprising:

a thin-walled tubing of elastomeric material;

a ring formed of a rigid tubular section;

a noose formed by the passage of said tubing through said ring, said noose being adapted for encircling said tube without occluding same; said tubing being of such a size that when pulled to a snug fit flattens out against the wall of said tube, thereby increasing the surface contact area and thus the total frictional force between said tube and said tubing resulting in a secure slip-proof grip of said noose about said tube extending from said body;

the ends of said tubing being flexibly extendable about a portion of said body for engagement with each other by means secured to at least one end of said tubing so as to secure said tube to said body; and

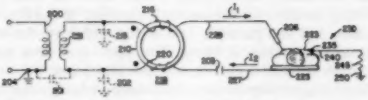
said ring being made of an elastomeric material having a durometer in the range of 75–85.

4,437,464

ELECTROSURGICAL GENERATOR SAFETY APPARATUS

James J. Crow, Englewood, Colo., assignor to C.R. Bard, Inc., Murray Hill, N.J.

Filed Nov. 9, 1981, Ser. No. 319,423
Int. Cl.³ A61B 17/39
U.S. Cl. 128—303.14 10 Claims



1. In an electrosurgical system having an electrosurgical generator for providing electrosurgical power at an operating frequency, an active electrode for applying said electrosurgical power to a patient, active electrical circuit means for connecting in a first electrical circuit said active electrode and said generator for supplying current from said generator to said active electrode and return electrical circuit means for returning said current in a second electrical current from said patient to said generator, the improvement comprising,

safety apparatus for preventing patient burns, comprising,

means responsive to the current flowing in said first circuit and responsive to the current flowing in said second circuit, for inserting an electrical impedance in series with said first circuit and said second circuit when said current flowing in said first circuit is not substantially equal to the current flowing in said second circuit, said impedance having a magnitude sufficient to reduce the current flowing in said first circuit and said second circuit to a value low enough to prevent patient burns.

4,437,465

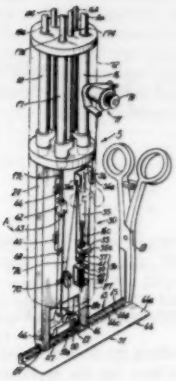
MEDICAL TREATMENT SEWING MACHINE

Reishi Nomoto, Kanagawa; Masahiro Akimoto, Hino, and Masayoshi Takahashi, Sagamihara, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 148,595, May 12, 1980, abandoned.
This application Feb. 1, 1982, Ser. No. 344,774
Claims priority, application Japan, May 17, 1979, 54-60642
Int. Cl.³ A61B 17/06
U.S. Cl. 128—340 6 Claims

1. A suturing machine for surgical operations, comprising a suturing instrument; a control device; means for clamping the edges of the human parts to be sewn up, said suturing instrument having a needle carrying a thread, said clamping means including guide means for guiding the suturing instrument thereon along the parts to be sewn up, said suturing instrument including a base, a needle holder turnably mounted on said base, the needle being secured to the needle holder, a loop taker having a hook and turnably mounted on the base and operative for catching a thread loop formed on the needle, means to supply a predetermined amount of the thread to the needle, first transmission means adapted for reciprocating movement relative to the human parts to be sewn up and connected to the needle holder, second transmission means adapted for reciprocating movement relative to the human parts to be sewn up and connected to said loop taker, and third transmission means adapted for reciprocating movement relative to the human parts to be sewn up and connected to said supply means; said base of the suturing instrument being formed with groove means which are adaped to engage with the guide means of the clamping means so as to move the suturing instrument along the human parts clamped in the

clamping means during the suturing operation; said control device including a fluid source, switching means operatively connected thereto and electric circuit means controlling said switching means; a plurality of hydraulic cylinders connected to said fluid switching means and each having a rod reciprocable in a respective cylinder, each respective rod being connected to the first transmission means, second transmission means and third transmission means, respectively; and a manually operated switch for activating said electric circuit means



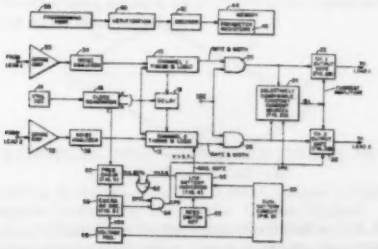
which sequentually operate said switching means which cause the sequential movement of the respective rods relative to the assigned cylinders to sequentially operate said first, second and third transmission means which respectively operate the needle so that it penetrates the human parts clamped in said clamping means, the loop taker catching the thread loop from the needle and the thread supply means supplying the thread to the needle to form up a suturing seam in the human parts to be sewn up while the suturing instrument is guided on the guide means along the human parts clamped in the clamping means.

4,437,466

CARDIAC PACER WITH IMPROVED BATTERY SYSTEM, OUTPUT CIRCUITRY, AND EMERGENCY OPERATION

Stanley H. Saulson, Miami; Edward A. Schroeppel, Miramar, and Peter P. Tarjan, Miami, all of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Mar. 2, 1981, Ser. No. 239,467
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PS **2 Claims**



1. A battery powered implantable tissue stimulator of the type having stimulating logic means and output means for producing output stimulation pulses on a lead at a given rate, pulse width and amplitude determined by said stimulating logic, wherein the improvement in the battery circuit comprises

a main battery with a terminal,

an emergency battery,

means interconnected between said batteries for steering current to said battery terminal from both said batteries when the voltage level of said main battery drops below a predetermined level,

a first capacitive element connected to said terminal in parallel with said main battery,

a diode, and

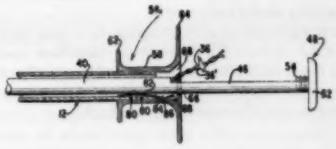
a second capacitive element connected via said diode to said terminal in parallel with said main battery, said terminal being connected to power said output means, and the junction of said diode and said second capacitive element being simultaneously connected to power said stimulating logic means at the same time as said output means, whereby said stimulating logic power supply is isolated from the output power supply to minimize the effect of an output stimulation pulse on the voltage powering said stimulating logic means.

4,437,467

APPARATUS FOR MONITORING FETAL HEARTBEAT AND THE LIKE

Joel N. Helfer, Cheshire, and Phillip W. King, Wallingford, both of Conn., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,799
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—642 **6 Claims**



1. An apparatus for use in monitoring fetal heartbeat and the like, comprising:

a tubular member having a distal end adapted to be inserted through the vagina and cervix of a women in labor;

an electrode assembly movably mounted in the tubular member, the assembly having a coil being adapted to be rotatably introduced into the skin of a fetus for attachment thereto to permit the electrode assembly to detect a biosignal from a fetus;

means for transmitting a signal detected by the electrode assembly;

means for applying a rotary force to turn the coil in response to a linear force applied by a user to the applying means for introducing the coil into the fetal skin; and

means for yieldably resisting the linear force applied by the user for enabling the user to sense resistance to the turning of the coil whereby the user may detect that the coil has penetrated the fetal skin.

4,437,468

ULTRASOUND SCANNING SYSTEM WITH SEMI-INDEPENDENT TRANSDUCER ARRAY

Paul D. Sorenson, Blaine, and Dale A. Dickson, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 3, 1982, Ser. No. 414,704
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **7 Claims**

1. An ultrasound scanning system for scanning the human back comprising:

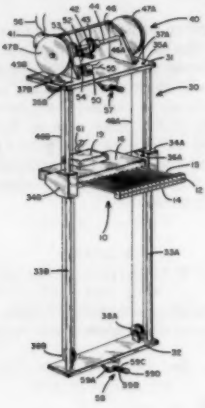
a housing;

means for mounting the housing relative to a human back for movement in a movement plane generally parallel to a plane of the back;

a linear array of transducer shoes;

each transducer shoe being mounted on a plunger;

the plungers being slidably mounted in the housing for movement generally perpendicular to the movement plane, while each shoe moves along a respective movement line;



each transducer shoe having a transducer for ultrasound scanning of the back; and

bias means mounted in the housing for urging each plunger toward the back for maintaining transducer contact with the back, each plunger moving independently of the others and independent of the position of the housing, which remains out of contact with the back.

4,437,469

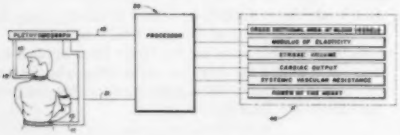
SYSTEM FOR DETERMINING CHARACTERISTICS OF BLOOD FLOW

Ljubomir Djordjevich, Chicago, and Max S. Sadove, River Forest, both of Ill., assignors to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Filed Sep. 29, 1980, Ser. No. 191,387

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—672 **28 Claims**



1. A method for measuring a blood circulation characteristic comprising measuring electrical impedance across a section of a living body having an unobstructed blood flow, simultaneously with said measurement of electrical impedance measuring blood pressure in said body, and passing the values of impedance measurement and also the values of blood pressure measurement, each in the form of an electrical signal, through a processor and determining from the electrical impedance and blood pressure signals electrical signals representing said blood circulation characteristic.

4,437,470

PROCESS AND APPARATUS FOR MEASURING BLOOD PRESSURE

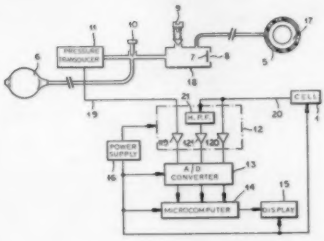
Jean-Louis Prost, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland

Continuation-in-part of Ser. No. 181,620, Aug. 26, 1980, abandoned. This application May 14, 1982, Ser. No. 378,254

Claims priority, application Switzerland, Aug. 28, 1979, 7785/79

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—679 **10 Claims**



1. A process for measuring a person's blood pressure, comprising the steps of:

(a) temporarily blocking the flow of blood on an extremity of such person's body by the application of astringent pressure;

(b) applying a photosensitive element to an illuminated skin area of said extremity, downstream of the flow-blocking location, with a contact pressure ranging between substantially 50 and 150 g/cm^2;

(c) continuously measuring an output signal of said photosensitive element, representative of the instantaneous transparency of said skin area, during a period of progressive relaxation of said astringent pressure;

(d) averaging said output signal to obtain a mean-transparency curve plotted against time;

(e) measuring several values of said astringent pressure at instants corresponding to respective points of said mean-transparency curve; and

(f) calculating a predetermined fraction of the sum of said several values as an indication of systolic blood pressure.

4,437,471

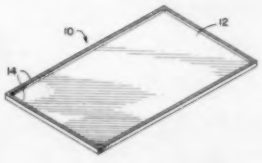
IMPLEMENT FOR MEASURING SKIN TEMPERATURES

Jeffrey Nelson, 20 Allison Rd., Newport News, Va. 23602

Filed Jan. 13, 1982, Ser. No. 339,061

Int. Cl.³ A61B *10/00*; G01N *11/12*

U.S. Cl. 128—736 **5 Claims**



1. A device for indicating the state of relaxation or tension of an individual with respect to a particular optimum predetermined temperature of the individual as measured by the individual's fingertip skin temperature comprising:

a thermally conductive planar surface;

two temperature sensitive liquid crystal indicators located on said planar surface, one indicator only becoming visible

when the individual's fingertip skin temperature is less than the predetermined temperature, and the second indicator only becoming visible when the individual's skin temperature is greater than the predetermined temperature; and

a plurality of temperature sensitive liquid crystal relaxation cues located on said planar surface, said relaxation cues becoming visible only when the skin temperature of the individual is less than that of the predetermined temperature of the individual, wherein said temperature sensitive liquid crystal indicators indicate the proximity of the individual's fingertip skin temperature to that of the predetermined temperature and said temperature sensitive relaxation cues assist the individual in attaining the predetermined temperature by allowing the individual to recall certain learned relaxation techniques.

4,437,472

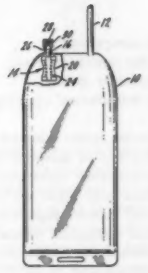
APPARATUS FOR COLLECTING FLUIDS

Henry Naftulin, 8341 N. Kenton Ave., Skokie, Ill. 60076

Continuation-in-part of Ser. No. 275,498, Jun. 19, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 428,143

Int. Cl.³ A61B *5/00*; **B65D** *33/00, 81/00*

U.S. Cl. 128—767 **7 Claims**



1. In combination with a flexible container used to collect and defibrinate blood therein, an insitu fibrin filter means positioned within said container and in communication with the outlet port of said container for collecting fibrin prior to its entry into said outlet port, comprising: a perforated inner tube member having an upper end extending into said outlet port, and a lower end extending into said container; and reticulated foam insert secured around said inner tube member, said inner tube member being sealed at its other end so as to preclude the entry of blood thereinto.

4,437,473

ORTHOPEDIC DIAGNOSTIC PROCEDURES AND APPARATUS THEREFOR

Raymond A. B. Mollan, Holywood, Ireland, assignor to National Research Development Corporation, London, England

Filed Mar. 26, 1982, Ser. No. 362,516

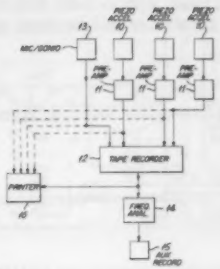
Claims priority, application United Kingdom, Apr. 3, 1981, 8110528

Int. Cl.³ A61B *5/12*

U.S. Cl. 128—773 **6 Claims**

1. An orthopaedic diagnostic procedure comprising the steps of:

detecting vibrations emitted from a moving joint in at least the subsonic frequency range, and



analyzing the detected emissions to determine whether or not a predetermined pathological condition exists.

4,437,474

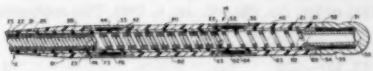
METHOD FOR MAKING MULTICONDUCTOR COIL AND THE COIL MADE THEREBY

Charles A. Peers-Trevarton, Coral Springs, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jul. 16, 1982, Ser. No. 399,063

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—784 **5 Claims**



1. A method for making a multiconductor coil having an outer diameter equal to the diameter of a winding mandrel plus the diameter of wires being coiled with homogeneity of the insulating coating and the insulation between the wires peserved, said method comprising the steps of: winding a first uninsulated wire conductor on a winding mandrel with a predetermined spacing between adjacent turns of the coil of wire conductor, coating the uninsulated coil of wire conductor with an insulating coating, repeating the above two steps for each additional wjre conductor to be included in the multiconductor coil, and after the insulating coating on each wire conductor coil has dried and/or solidified, screwing each additional coil into the first coil to form a multiconductor coil having the desired homogeneity of the insulating coating and of the insulation between adjacent turns in the multiconductor coil.

4,437,475

TRANSVENOUS CARDIOVASCULAR INTEGRATED LEAD ANCHORING SLEEVE, PROTECTOR, AND PERMANENT LEAD INTRODUCER STOP GAP

David L. White, Wyoming, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 28, 1981, Ser. No. 297,469

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—785 **4 Claims**

1. A body implantable lead comprising:

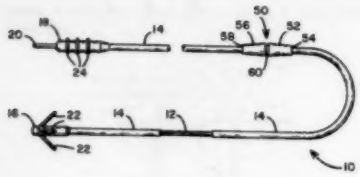
a conductor having a proximal end and a distal end;

an insulating sheath of body compatible material having an outside diameter, covering said conductor;

an electrode having an outside diameter greater than the outside diameter of said insulating sheath, coupled to said distal end of said conductor;

an electrical connector having an outside diameter greater than the outside diameter of said insulating sheath, coupled to said proximal end of said conductor; and

an anchoring sleeve fabricated of a pliant, compressible material, having a proximal end, a distal end, a circumferential suture groove completely encircling said anchoring sleeve and a lumen with an inside diameter greater than the outside diameter of said insulating sheath, through



which said insulating sheath passes, said electrode and said electrical connector each having an outside diameter greater than the inside diameter of the lumen of said anchoring sleeve whereby said anchoring sleeve is permanently attached and slideably mounted about said insulating sheath.

4,437,476

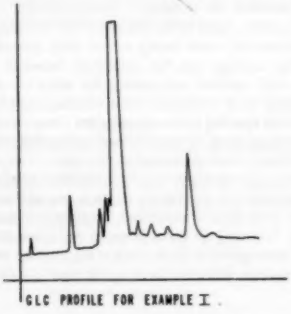
PRINS REACTION PRODUCTS OF DIISOBUTYLENE, DERIVATIVES THEREOF, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

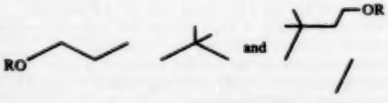
Division of Ser. No. 280,683, Jul. 6, 1981. This application Jun. 24, 1982, Ser. No. 391,594

Int. Cl.³ A24B *3/12*

U.S. Cl. 131—276 **1 Claim**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco or smoking tobacco article component comprising the step of adding to a smoking tobacco composition or smoking article component an aroma or taste augmenting or enhancing quantity of at least one prins reaction product or a derivative thereof defined according to a structure selected from the group consisting of the structures:



wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond and "R" represents hydrogen or acetyl.

4,437,477

MAKE OF UNIT COMPRISING A CONTAINER AND AN APPLICATOR CLOSING THE CONTAINER

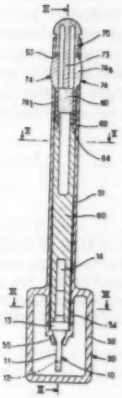
Jean-Louis H. Gueret, Paris, France, assignor to "L'Oreal", Paris, France

Filed May 11, 1982, Ser. No. 377,172

Claims priority, application France, Jun. 1, 1981, 81 10785

Int. Cl.³ A45D *40/30*

U.S. Cl. 132—88.5 **11 Claims**



1. In a make-up unit comprising:
(a) container means for liquid make-up;
(b) a neck to said container means;
(c) means defining a withdrawal opening of said container means;
(d) detachable applicator means adapted to enter said neck;
(e) make-up applying means adapted to draw off liquid make-up from said container means, to transport it, and to spread it on a surface to be made up, said make-up applying means including means stoppering said withdrawal opening of the said container means in a substantially leakproof manner when the container is closed by means of the applicator means; and
(f) wiper lip means bounding said withdrawal opening and arranged to grip the make-up applying means, the said make-up applying means and said withdrawal opening each having a non-circular cross section which prevents rotation of said make-up applying means relative to said wiper lip means when gripped thereby, the improvement wherein said applicator means comprises;
(g) first and second elements fitted one within the other;
(h) means interconnecting said first and second elements so that one thereof is capable of relative motion with respect to the other, said first element carrying said make-up applying means; and
(i) means on said second element for releasably engaging said neck of the container.

4,437,478

COIN COUNTING AND DISPENSING APPARATUS

Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,426

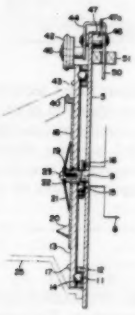
Claims priority, application Japan, Jul. 8, 1980, 55-92280

Int. Cl.³ G07D *5/02, 9/04*

U.S. Cl. 133—5 R **3 Claims**

1. A coin dispensing apparatus comprising a hopper for holding a supply of coins, a rotary disc in said hopper that is inclined to the horizontal and has coin engaging means on an upper face thereof, said rotary disc being rotatable in one direction to carry coins upward from near the bottom of the

hopper, a delivery knife near the top of the disc to which coins are delivered by the rotary disc for guidance to a delivery chute and which has a substantially upwardly facing surface that the coins engage edgewise, a counter roller having a periphery edgewise engageable by coins, mounting means whereby the counter roller is carried for free rotation about its axis and for bodily motion transversely to its axis downwardly towards and upwardly away from a defined position in which the counter roller is spaced from said surface by a distance less than the diameter of a coin of predetermined denomination, said counter roller being biased downwardly to be moved upward from said position by passage along said surface of a coin of said denomination, and electrical switch means responsive to movement of said counter roller out of said position for counting each coin that passes the counter roller, said coin dispensing apparatus being characterized by:



(A) said switch means comprising a pair of elements between which there is a slot that opens in a pair of opposite directions and which cooperate to produce an output upon entry into said slot of an actuating member; and

(B) an actuating member connected with said mounting means to be moved in one of said opposite directions by upward movement of the counter roller and in the other of said opposite directions by downward movement of the counter roller, said actuating member being arranged to enter said slot upon movement of the counter roller out of said position and to move freely in said slot in said one direction so that the counter roller can be passed by coins substantially larger in diameter than said coin of predetermined denomination.

4,437,479

DECONTAMINATION APPARATUS FOR SEMICONDUCTOR WAFER HANDLING EQUIPMENT

Juan Bardina, Menlo Park, and Mikel Gonzalez, San Jose, both of Calif., assignors to Atcor, Mountain View, Calif.

Filed Dec. 30, 1981, Ser. No. 335,765
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—68 **8 Claims**

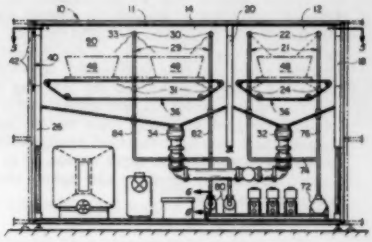
1. A device for decontaminating semiconductor wafer handling equipment, comprising:

a first chamber adapted to receive semiconductor wafer handling equipment, the first chamber including,

an activatible means for applying decontamination liquid to handling equipment in the first chamber;

means for restricting contaminants from handling equipment to the first chamber, which means includes a generally leakproof first door covering an opening into said chamber; and

means for draining decontamination liquid from the first chamber; means for opening said first door to allow handling equipment to be loaded and unloaded into said first chamber; and



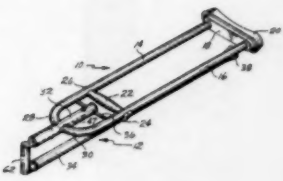
a second chamber adapted for receiving handling equipment from said first chamber, the second chamber including means for directing a drying fluid to handling equipment therein.

4,437,480

MECHANISM FOR TIGHTENING AND REINFORCING THE JOINT OF A FOLDING STRUCTURE

Emmett O. Husa, 1614 N.W. 85th, Seattle, Wash. 98117

Filed Jul. 8, 1982, Ser. No. 396,155
Int. Cl.³ A61H *3/02; F16C 11/10*
U.S. Cl. 135—74 **3 Claims**



2. In a folding crutch structure, comprising:

first and second sections of a load carrying stile, each including an end portion, wherein at least the end portion of the second section is tubular;

connector means for connecting the two sections together in a manner permitting said sections to be moved between a first position in which the two sections are generally aligned with each other and a folded position in which each section is adjacent the other section, said connector means comprising a first end piece connected to the end portion of the first section, a second end piece which is telescopically received within the tubular end portion of the second section, a link position between said first and second end pieces, pivot pin means connecting the ends of the link to said end pieces in a manner permitting said end pieces, and the first and second sections connected thereto, to be pivotally moved between a first position in which they are axially aligned with the link and a second position in which they are both substantially perpendicular to the link and adjacent one another, stop means for preventing telescopic movement of the second end piece completely outfrom the tubular end portion of the second section, and releasable lock means carried by said second end piece and engagable with the tubular end portion of the second section for locking the two sections together in said use position, said lock means including a depressible lock button; and

a joint tightening and reinforcing mechanism, comprising a collet member attached to the end portion of the first section and including a plurality of collet jaws which extend axially endwise beyond the end of the end portion

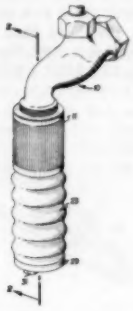
of said first section, and external threads on the collet member axially inwardly of the collet jaws, and a cam ring which is slidably mounted on the tubular end portion of the second section, and which includes an internally threaded end portion, adapted for mating engagement with the external threads on the collet member, and a cam portion spaced axially inwardly of the threaded portion, whereby when the two sections are telescopically together and axially aligned, and the cam ring is screwed onto the collet member, its cam section exerts a radially inwardly directed squeezing force on the collet jaws, bringing them into tight frictional engagement with the tubular end portion of the upper section, so as to, in that manner, structurally reinforce and tighten the joint between the two sections.

4,437,481

SELF-ACTUATING DRIP VALVE

John M. Chamberlin, 2800 Dunsinane Rd., Pensacola, Fla. 32503, and John R. Chamberlin, 1767 Ensenada Dos, Pensacola Beach, Fla. 32561

Filed May 20, 1982, Ser. No. 380,315
Int. Cl.³ E03B *7/12*
U.S. Cl. 137—60 **26 Claims**



1. A self-actuating drip valve for attachment to a standard faucet to prevent freezing of exposed water pipes comprising:
a housing defining a normally closed chamber removably attachable to said faucet;
valve seat means, said valve seat means being adjacent said faucet and a portion of said housing when said housing is secured to said faucet;
a double-walled bellows fillable with a liquid between said walls having a proximal end attached to said housing and a distal end remote from said housing;
valve means extending substantially coaxially within said bellows in all positions of said valve means and having a proximal end for mating with said valve seat means and a distal end attached to said distal end of said bellows whereby said valve is moved away from said seat when said liquid in said bellows freezes.

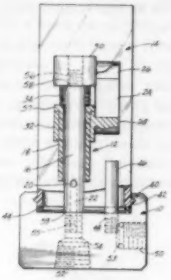
4,437,482

WATER-SENSITIVE PROBE VALVE FOR USE WITH A GAS LEAK DETECTOR

Loren C. Harrison, 8607 Danby Ave., Whittier, Calif. 90606

Filed Sep. 22, 1982, Ser. No. 421,146
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—67 **15 Claims**

1. A cutoff valve for water-sensitive instruments comprising:
(a) a base having an inlet and an outlet;
(b) a case, removably secured to the base;
(c) a post secured to the base and extending into the case, the post having an exit port in communication with the outlet and opening in the case;
(d) a shuttle received on the post for translation along it to close the exit port in a closed position and to open the exit port in an open position;
(e) water-soluble band means;
(f) a first band support finger secured to the post and adapted to receive the water-soluble band;



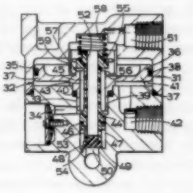
(g) a second band support finger secured to the shuttle and adapted to receive another end of the band; and
(h) biasing means between the post and the shuttle urging the shuttle to the closed position, the band opposing the spring means and keeping the shuttle in the open position until the band breaks in response to water.

4,437,483

FLUID-PRESSURE-OPERABLE RELAY VALVES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 17, 1981, Ser. No. 274,401
Claims priority, application United Kingdom, Jun. 18, 1980, 8019956
Int. Cl.³ F16K *11/14*
U.S. Cl. 137—85 **12 Claims**



1. A fluid-pressure-operable valve comprising a housing having an inlet port, an outlet port, and an exhaust port, an inlet valve for controlling communication between said inlet port and said outlet port, an exhaust valve for controlling communication between said outlet port and said exhaust port, a control member in the housing for controlling sequential operation of said valves in response to a control force on said control member, said inlet valve comprising an inlet valve member and an inlet seating which surrounds said inlet port, said inlet valve member being engageable with said inlet seating, and a spring for urging said inlet valve member towards said inlet seating in opposition to the effect of fluid pressure at said inlet port, said exhaust valve comprising an exhaust valve member and an exhaust seating provided on said control member, said exhaust valve member having an exhaust valve face which is engageable with said exhaust seating, said exhaust valve member being relatively movable with respect to said control member, and said inlet and exhaust valve members comprising a single integral valve component.

4,437,484
UTILITY WATER SYSTEM WITH A PRESSURELESS STORAGE CONTAINER, PARTICULARLY FOR SOLAR INSTALLATIONS

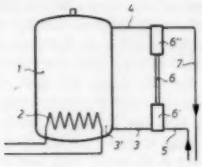
Karsten Laing, Kaiserallee 51, 7500 Karlsruhe; Oliver Laing, Weissdornweg 14, 7400 Tubingen; Nikolaus Laing, Hofener Weg 35-37, 7148 Remseck 2, all of Fed. Rep. of Germany, and Ludwig Ludin, Kesselackerweg, 5611 Anglikon, Switzerland

Filed Mar. 16, 1982, Ser. No. 358,883

Claims priority, application Switzerland, Mar. 16, 1981, 1755/81

Int. Cl.³ F04B *17/00*

U.S. Cl. 137—99 **5 Claims**



1. A warm water storage system for supplying warm water under pressure to a network including a warm water storage tank where the pressure above the water level in the tank is equal to ambient pressure, a pressurized cold water supply connecting with a cold water region of the tank, and a warm water takeoff region of the tank connecting with said network, characterized in having a warm water booster pump positioned between said warm water takeoff region and said network, and in having a positive displacement cold water motor connected to said booster pump and positioned between the cold water supply and the cold water region such that the pressure of said cold water supply will drive the motor to in turn drive the booster pump such that pressure in the cold water supply is transferred to said network.

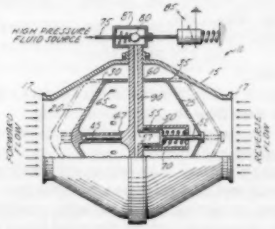
4,437,485
CHECK VALVE

Robert B. Goodman, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 219,753, Dec. 23, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,895

Int. Cl.³ F16K *17/30*

U.S. Cl. 137—220 **7 Claims**



1. A valve for checking reverse flow and excessive forward flow therethrough, said valve including a housing defining a flow conduit therethrough, and first and second valve elements disposed in said housing and characterized by said flow conduit being defined substantially by said first and second valve elements and said housing, each of said first and second valve elements including means interiorly thereof which support said valve elements for independent reciprocation thereof within said housing by the impingement of fluid flow thereagainst, said first and second valve elements having oppositely facing convex, outer surfaces substantially unobstructed to forward and reverse flows, respectively, through said valve, said first valve element being maintained in an unseated condition by impingement of forward fluid flow against said outer surface thereof and being seated in part by reverse flow through said conduit, past said outer surface, thereof, thereby creating a low pressure area adjacent thereto, said second valve element being unseated by impingement of reverse flow against said outer surface thereof and seated by excessive forward flow through said conduit, past said outer surface thereof, thereby creating a low pressure area over said second valve element outer surface.

4,437,486
LINE REMOVABLE VALVE STRUCTURE WITH PIPELINE SUPPORT MEANS

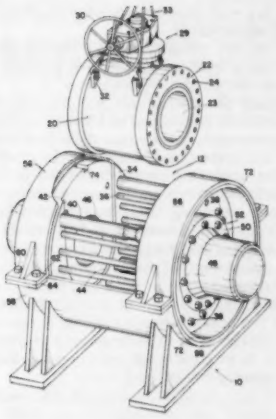
Giuseppe Bianchi, Cava Manara, Italy, assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Apr. 8, 1982, Ser. No. 366,682

Claims priority, application European Pat. Off., Jan. 28, 1982, 82830018

Int. Cl.³ F16K *51/00*

U.S. Cl. 137—315 **6 Claims**



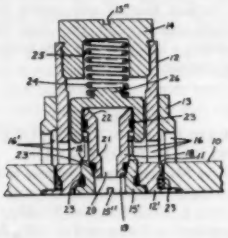
1. A line-removable valve structure comprising:
a pipeline-supporting cage and a valve cartridge; said cage comprising:
a pair of parallel, thick steel end plates with flow passages therethrough;
a series of studs interconnecting said end plates;
a nut threaded onto at least one end of each of said studs;
hub members carried on the outboard sides of said end plates around said flow passages for installing said cage into a pipeline; and
linear, hydraulic ram force-applying members connected between said end plates for selected limited separation thereof upon loosening of said threaded nuts;
said valve cartridge comprising:
a valve body with flow passages therethrough and a movable valve closure member for blocking and unblocking said flow passages;
said valve body being receivable between said thick end steel plates; and
seals rings for sealing between the ends of said valve body and said end plates around said flow passages; and
said valve structure including:
separate telescoping, cylindrical guide means axially extending between said end plates so as to enable limited relative axial movement of said end plates and preventing relative radial movement thereof.

4,437,487

LIGHTNING PROTECTED CHECK-TYPE DRAIN VALVE

Frank E. Marmon, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Aug. 31, 1981, Ser. No. 297,712
Int. Cl.³ F16K 43/00
U.S. Cl. 137—322 6 Claims



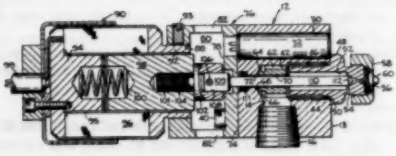
1. A drain valve assembly for a fuel tank comprising:
a housing secured to a wall of said tank and disposed internally of said tank;
an opening in a wall of said housing for the flow of liquid in said tank therethrough;
a cylinder slidably mounted in said housing and under a force normally tending to position it whereby it overlies and blocks said housing opening; and
a piston slidably mounted in said cylinder, said piston being defined at its end inwardly of said tank by a surface having an area substantially greater than the area of the surface at its outer end and located between said cylinder and said housing to resist said normal force and to overlie and block said housing opening, said piston having a longitudinal passage extending therethrough allowing pressure externally of said tank to act on and against the interior of said cylinder and said greater area piston surface to maintain said cylinder out of the overlying and blocking position, and simultaneously to move said piston to the overlying and blocking position and an overpowering force on the outer end of said piston is required to move it relative to said cylinder so as to maintain said cylinder and said piston out of its position of overlying and blocking said housing opening as aforesaid.

4,437,488

SOLENOID VALVE FOR HOT MELT MATERIAL

Thomas D. Taggart, Pacific Grove, and Robert E. Taggart, Carmel, both of Calif., assignors to Lockwood Technical Inc., Monterey, Calif.

Filed May 24, 1982, Ser. No. 381,040
Int. Cl.³ F16K 49/00; B05B 1/30
U.S. Cl. 137—334 9 Claims



1. A valve for hot melt material comprising a rigid body formed of thermally conductive material and having an external front surface, said body defining a bore having a cylindric portion bounded by a concave cylindric wall and being disposed inward of and in spaced apart relation to said front surface surface, said bore having a passage communicating between said cylindric portion and said front surface, an insert disposed in said cylindric portion, said passage having an inside dimension sufficiently large to afford introduction of said insert therethrough, said insert having an outer surface sized and shaped for disposition in said cylindric portion in heat conducting relation to said cylindric wall, said insert defining a central cylindric passage concentric with said outer surface and with said passage, means mounted in said passage adjacent said front surface and spaced from said insert for defining a valve seat in axial alignment with said central cylindric passage in said insert, a valve member having a cylindric stem extending through said central cylindric passage and a tip engagable with said seat for arresting flow through said seat, said stem having an outer diameter less than the inner diameter of said central cylindric passage so as to form a substantially annular channel between said stem and said central cylindric passage, said annular channel having a radial extent sufficiently large to afford free movement of said stem relative said central cylindric passage and sufficiently small so that hot melt material in said annular channel has insufficient thickness to cause significant impedance to heat energy flow therethrough, said body defining a conduit for delivering hot melt material to said annular channel at the end thereof remote from said valve seat, means for supplying heat energy to said body, and means for selectively reciprocating said valve body from an arrest position at which said tip is engaged with said seat and a flow position at which said tip is spaced from said seat.

6. A solenoid valve for controlling fluid flow comprising a body defining a bore, means disposed in said bore for forming a fluid discharge passage, said passage forming means having a seat surrounding said discharge passage, an elongate valve stem having a tip for cooperating with said seat to arrest fluid flow through said discharge passage, said stem having a portion remote from said tip that extends exteriorly of said body, a magnetic core part fixed to said portion, a coil circumscribing said core part such that energization of said coil moves said valve tip away from said seat to afford fluid flow through said discharge passage, a coil support member rigid with said coil and having a first threaded part concentrically circumscribing said stem, a second threaded part rigid with said body and complementally engagable with said first threaded part so that rotation of said coil support member relative said body moves said coil toward or away from said seat, means for selectively locking the relative rotational position of said first and second threaded parts, means rigid with said coil for limiting movement of said core part in response to energization of said coil, and means for resiliently biasing said stem away from said limiting means and into engagement with said seat.

4,437,489

GAS FLOW CONTROLLER

Michael A. Casale, Newark, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 24, 1981, Ser. No. 334,417
Int. Cl.³ F16K 31/02
U.S. Cl. 137—487.5 4 Claims

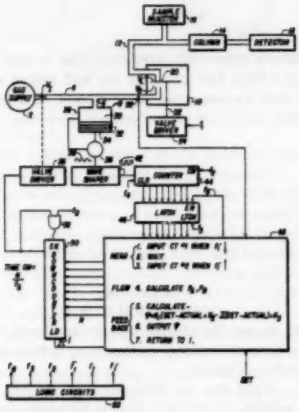
1. Apparatus for controlling the flow of a gas so as to maintain a constant mass flow to a load, comprising
a first valve having an input to which gas under pressure may be applied and an output,
means defining a volume V having an inlet port coupled to the output of said first valve and an outlet port,
pressure signal producing means including a transducer for producing, when activated, an electrical signal representing the pressure in said volume V,
means for placing said first valve in an open position during a first portion of each of a plurality of successive cycles and for placing it in a closed position during the remainder of each cycle, each cycle having a duration Δt,
means defining a reference volume R_V,
a second valve having an input coupled to the outlet port of said volume V and an output coupled to said reference volume R_V,
means placing said second valve in a closed position during the said first portion of each cycle, for a second portion

occurring immediately thereafter, and during the last portion of each cycle and placing said second valve in an open position between the second and last portions of each cycle,

a third valve having an input coupled to said reference volume R_V and an output to which a load can be coupled,

means for placing said third valve in an open position when said second valve is closed and placing said third valve in a closed position when said second valve is open,

means activating said pressure signal producing means during the second portion of each cycle so as to produce a signal representing the pressure P_A in said volume V when said first and second valves are closed,



means activating said pressure signal producing means during the last portion of each cycle so as to produce a signal representing the pressure P_B in said volume V when said first and second valves are closed,

means responsive to the signals P_A and P_B for deriving a control signal representing the mass flow m through the volume V equal to

$$(P_A - P_B)/\Delta t \cdot V/RT$$

wherein R is the universal gas constant and T is the temperature of the gas in the volume V, and

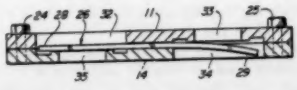
control means responsive to said control signal for controlling the flow of gas through said first valve so as to maintain the mass flow m at a predetermined set value.

4,437,490

REED VALVE ASSEMBLY

Robert J. Demers, and Rick Schilbe, both of London, Canada, assignors to Webster Air Equipment Ltd., London, Canada

Filed Sep. 30, 1981, Ser. No. 306,947
Claims priority, application Canada, Jul. 6, 1981, 381132
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—512.4 **2 Claims**



1. A reed valve assembly comprising, in combination:

(a) a first base member having an exterior surface and an interior face;

(b) a second base member having an exterior surface and an interior face;

(c) mounting means for securing said first and second base members together with their respective interior faces abutting each other;

(d) at least one elongated reed having a flat intermediate portion disposed between a first free portion and a second free portion;

(e) a central depression in the exterior face of at least one of said first and second base members for receiving said flat intermediate portion of said reed and clamping said intermediate portion between the interior faces of the first and second base members;

(f) said first base member having a first recess complementary with the contour of said first free end portion of the reed to allow free flexure thereof into and out of the first recess and to allow the passage of a fluid through the first recess when the first free end portion is flexed into same and having a first inlet passage overlapped by said second free end portion of the reed;

(g) said second base member having a second recess complementary with the contour of said second free end portion of the reed to allow flexure thereof into and out of the second recess and to allow the passage of a fluid through the second recess when the second free end portion is flexed into same and having a second inlet passage overlapped by said first free end portion of the reed;

(h) each of said first and second recesses communicate respectively with a first outlet opening means and second outlet opening means, whereby each associated recess and outlet opening means form a passage through the respective base members;

(i) each of said first and second inlet passages of each of the first and second base members is disposed in the bottom of an associated depression having a depth greater than that of said central depression, and

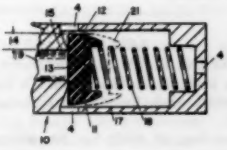
(j) a valve seat projecting from the bottom of each of the inlet passage depressions and having a distal seating surface against which the associated first and second free end portion of the reed abuts to prevent flow of fluid through the associated first and second inlet passages.

4,437,491

VALVE PISTON

David E. Brown, 236 W. 17th St., Erie, Pa. 16512

Filed Apr. 21, 1982, Ser. No. 370,358
Int. Cl.³ F16K *15/00*
U.S. Cl. 137—540 **6 Claims**



1. A valve having a body with a generally cylindrical cavity having an inlet and an outlet adapted to be connected in a fluid line,

a valve seat in said cavity around said outlet,

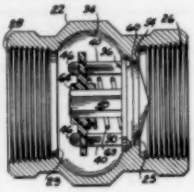
a valve plunger in said cavity said plunger having a generally flat generally circular end adapted to rest on said valve seat,

said plunger having an outside contoured surface joining said flat end,

said outside surface being contoured so that an arc follows said contour when said arc has a center of curvature at any point on the outer periphery of said flat end and said arc has a radius passing through a plane extending perpen-

dicular to said flat end and containing the central axis of said plunger.

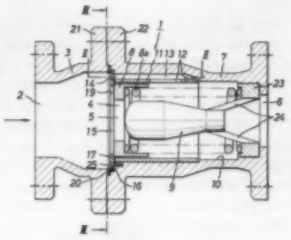
4,437,492
POPPET CHECK VALVE
Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73108
Filed Feb. 25, 1982, Ser. No. 352,287
Int. Cl.³ F16K *15/06*
U.S. Cl. 137—543.13 **4 Claims**



1. A check valve, comprising:
a housing having a fluid passageway therethrough and having a valve seat normal to the axis of the passageway;
poppet valve means for closing the passageway in response to fluid flow in one direction,
said poppet valve means including a poppet valve having a head provided with a seat for sealing with the housing valve seat,
said poppet valve having a coaxial polygonal-shaped shank projecting downstream from its head;
poppet valve guide means for maintaining said poppet valve in axial alignment with the passageway and preventing angular rotation of the poppet valve relative to the housing,
said poppet valve guide means including a plurality of webs projecting into the fluid passageway from the inner wall surface of said housing for maintaining said poppet valve head coaxial with the housing valve seat,
said webs each having an inwardly projecting lug at its end portion opposite the housing valve seat;
a shank guide supported by said webs coaxial with the fluid passageway on the upstream side of said web lugs,
said shank guide having a bore complemental with the periphery of said shank permitting longitudinal sliding movement of said shank relative to said shank guide;
resilient means interposed between said shank guide and said poppet valve head for biasing said poppet valve toward said housing valve seat; and,
means preventing angular rotation of said shank guide relative to said housing.

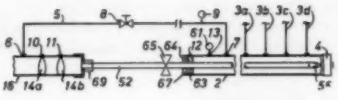
4,437,493
CONSTANT FLOW CONTROL VALVE
Kuniteru Okuda, and Jun Morita, both of c/o Oval Engineering Company Limited, 10-8, Kamiochiai 3-chome, Shinjuku-ku, Tokyo, Japan
Filed Aug. 18, 1982, Ser. No. 409,342
Claims priority, application Japan, Aug. 19, 1981, 56-128808
Int. Cl.³ F15D *1/02*
U.S. Cl. 138—45 **2 Claims**

1. A constant flow control valve, which comprises:
a valve body formed with a chamber;
a cylindrically-shaped sleeve member disposed in said chamber and defining a by-pass passage therebetween, said sleeve member being provided with at least one aperature in fluid communication with said by-pass passage;
a needle rod co-axially disposed within said sleeve member to define a main flow passage;
a cylindrically-shaped piston-type body including a main flow orifice slidably disposed within said sleeve member;
a spring member disposed within said chamber of said control valve and acting on said piston-type body for balancing fluid dynamic pressure thereon; and



a selectively removable regulator plate means laterally-disposed within said chamber on said sleeve member and over said by-pass passage to permit adjustment of said control valve to a given constant flow rate.

4,437,494
MAINS INSERTION
Douglas C. Soper, Dorchester, and Brian Gould, Hoddlesdon, Darwen, both of England, assignors to British Gas Corporation, London, England
Filed Jun. 18, 1982, Ser. No. 390,080
Claims priority, application United Kingdom, Jun. 19, 1981, 8118965
Int. Cl.³ F16L *55/18*
U.S. Cl. 138—97 **9 Claims**



1. In a method for replacing a section of an existing fluid transportation main without disrupting fluid flow to individual service lines connected to the section until such time as an individual service line is to be disconnected from the section and re-connected to a replacement main, the steps of:
initially removing a portion of the existing main adjacent one end of the section to be replaced to thereby present a free end on the section;
maintaining fluid flow between the existing main and the section to be replaced by means of a bypass line during the removal of said portion;
inserting a length of a smaller replacement main into the section to be replaced through the free end of the latter, the internal end of the replacement main being open to flow of fluid whereby the section to be replaced and the inserted replacement main are in fluid communication;
interconnecting the replacement main and the existing main for fluid flow; and thereafter
removing said bypass line and allowing fluid to flow from the existing main and into the section to be replaced solely through said internal end of the replacement main whereby individual service lines may subsequently be isolated and connected directly to the replacement main without disrupting fluid flow to other service lines.

4,437,495

PIPES AND PIPE COATINGS

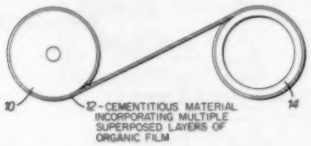
Johannes J. Zonsveld, Woking, England, assignor to University of Surrey, Guildford, England

Filed Sep. 15, 1981, Ser. No. 302,373

Claims priority, application United Kingdom, Sep. 20, 1980, 8030460

Int. Cl.³ F16L 9/16

U.S. Cl. 138—144 5 Claims



1. In a pipe length,

an innermost cylindrical layer in the form of a steel pipe which defines the passage of the pipe length,

a layer adjacent to and concentric with the steel pipe in the form of a helical winding of a cementitious material incorporating multiple, superposed, layers of network reinforcement of fibrillated organic film, said helically-wound layer being in a post-cracked condition and exhibiting multiple fine cracks in one surface when incorporated in the pipe length, and

a cylindrical weight-coating of concrete bonded to, and surrounding the helically-wound layer, bonding to the helically-wound layer being enhanced by the penetration of components of the concrete into the said multiple fine cracks of the cementitious material of the said layer.

4,437,496

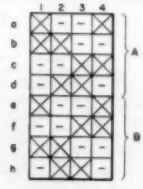
PAPERMAKERS FABRICS HAVING EQUALIZED WARP SEW-UP

Charles E. Thompson, Raleigh, N.C., assignor to Huyck Corporation, Wake Forest, N.C.

Filed Mar. 17, 1982, Ser. No. 359,095

Int. Cl.³ D03D 15/00; D21F 1/10

U.S. Cl. 139—383 A 5 Claims



1. An endless loop monoplanar papermakers' fabric formed of warp and weft yarns interwoven in a repeating sequence of first and second adjacent balanced weave patterns which patterns, alternate in the direction of the warp yarns, wherein said first weave pattern is characterized by the presence of warp yarns having, in a first sequence, differing numbers of interlacings and wherein said second weave pattern is characterized by said warp yarns being woven in a second sequence of numbers of interlacings, said second sequence of numbers of interlacings being the reverse of said first sequence so that the total number of interlacings in the combined first and second weave pattens is equal for all warp yarns.

4,437,497

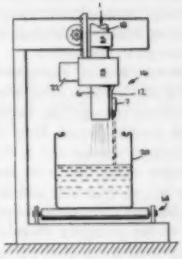
ULTRASONIC CONTROL OF FILLING A CONTAINER

Frederick A. Enander, 28 Sycamore La., Fair Haven, N.J. 07701

Filed Sep. 23, 1981, Ser. No. 305,002

Int. Cl.³ B65B 1/30, 3/22

U.S. Cl. 141—1 23 Claims



6. Apparatus for filling a container or the like with flowable material to a predetermined level using ultrasonic energy comprising:

means for holding the container in position to receive the material;

means for initiating a flow of material into the container;

source means disposed adjacent to the container for directing bursts of ultrasonic energy toward the container to be filled, the bursts being spaced apart at intervals;

echo sensing means disposed adjacent to the container;

a gate which opens at a predetermined delay with respect to a burst of ultrasonic energy, the delay corresponding to the time required for the burst to travel to the predetermined level and for its echo to return to the echo sensing means;

means for sensing the passage of an echo of a burst through the gate when the gate is open, the sensing of the echo being at the time the flowable material has attained the predetermined level; and

means for terminating the flow of material into the container in response to the sensing of the echo of a burst of ultrasonic energy at the predetermined delay.

19. A method for filling a container or the like with flowable material to a predetermined level using ultrasonic energy comprising the steps of:

initiating a flow of material into the container;

directing bursts of ultrasonic energy toward the container to be filled, the bursts being spaced apart at intervals;

sensing an echo at a predetermined delay with respect to a burst of ultrasonic energy when the predetermined level is reached;

terminating the flow of material into the container in response to the sensing of the echo of a burst of ultrasonic energy at the predetermined delay; and

directing a jet of gaseous fluid against the surface of the material being flowed into the container to displace bubbles, foam and the like on the surface of the material in the container to insure that a true surface is presented to the bursts of ultrasonic energy.

4,437,498

CARTON FILLING APPARATUS

Lawrence A. Pankratz, St. Paul, and Donald G. Cornica, Inver Grove Heights, both of Minn., assignors to Liquipak International, Inc., St. Paul, Minn.

Filed Nov. 9, 1981, Ser. No. 319,691

Int. Cl.³ B67C 3/02

U.S. Cl. 141—89 23 Claims

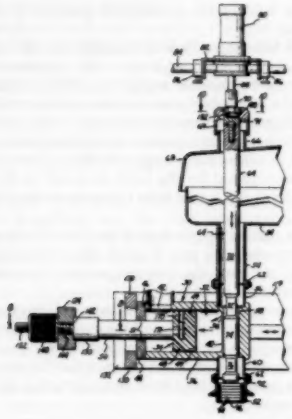
1. A container filling apparatus for filling an open top container with a predetermined quantity of a liquid food product, the container filling apparatus comprising:

a fill tank for holding the liquid;

a vertical passage having an inlet at an upper end communicating with the fill tank and having an outlet at a lower end from which the liquid is dispensed into the container;

a pumping chamber connected to the vertical passage by an inlet port and an outlet port for drawing liquid from the fill tank through the vertical passage and the inlet port into the pumping chamber and for pumping the liquid from the pumping chamber through the outlet port and the vertical passage to the outlet;

a vertically oriented, linearly movable valve member extending along a vertical axis downward through the fill tank and the vertical passage, the valve member having a portion which permits liquid flow from the fill tank through the vertical passage and to the inlet port to the pumping chamber when the valve member is in a first position along the vertical axis and which blocks liquid flow from the fill tank through the vertical passage and to the inlet port to the pumping chamber when the valve member is in a second position along the vertical axis, and



the valve member having a portion which blocks liquid flow from the pumping chamber through the outlet port and the vertical passage to the outlet when the valve member is in the first position and which permits liquid flow from the pumping chamber through the outlet port and the vertical passage to the outlet when the valve member is in the second position;

drive means for driving the pumping chamber to cause the pumping chamber to draw liquid into the pumping chamber through the inlet port and to pump liquid from the pumping chamber through the outlet port to the outlet; and

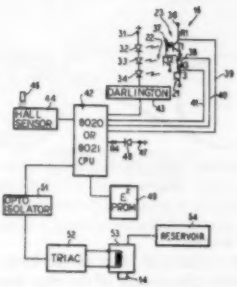
valve actuator means for moving the valve member along the vertical axis, the valve actutor means being coordinated with the drive means to cause the valve member to be in its first position when the drive means causes the pumping chamber means to draw liquid into the pumping chamber means and to cause the valve member to be in its second position when the drive means causes the pumping chamber means to pump liquid from the pumping chamber means to the outlet.

4,437,499

COMPUTER CONTROLLED SENSOR FOR BEVERAGE DISPENSER

Donald Devale, Sycamore, Ill., assignor to Everpure, Inc., Westmont, Ill.

Filed May 11, 1981, Ser. No. 262,129
Int. Cl.³ B65B *1/42*
U.S. Cl. 141—95 **1 Claim**



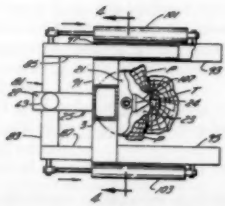
1. An automatic dispenser for small, medium and large cups including, a stand on which the cups can be placed, small, medium and large sensors mounted on the stand to sense small, medium and large cups, a micro-processor electrically connected to said small, medium and large sensors to receive electrical signals therefrom, and a dispensing valve mounted so as to dispense beverage into said cups connected to said microprocessor and controlled thereby, including an electrical erasable memory connected to said microprocessor for storing information as to the time required to fill the small, medium and large cups, including means for establishing the time to respectively fill the small, medium and large cups connected to said micro-processor, and said means for establishing the time to fill comprises a Hall sensor connected to said micro-processor and responsive to a magnet.

4,437,500

TREE CUTTING MECHANISM IN A TREE HARVESTER

Andre Larose, Macamic, Canada, assignor to Boreal Hydraulic Equipment, Macamic, Canada

Filed Sep. 30, 1982, Ser. No. 429,204
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—34 R **12 Claims**



7. A felling head for use in a tree harvester comprising: a main frame; means on the main frame for gripping a tree to be harvested; first and second rotary cutting devices mounted on the main frame beneath the gripping means, the first cutting device overlying the second cutting device and spaced a short distance therefrom; means for rotating the cutting devices; means for moving said cutting devices relative to the frame to cut through a tree held by the gripping means; and means for removing the cut portion of the tree located between the

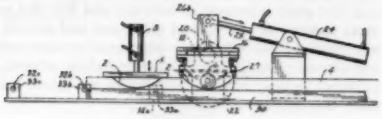
cutting devices in a manner to permit continued movement of the cutting devices through the tree.

4,437,501

CONTOURED DUNNAGE CUTTER

James W. Canada, Bessemer, and James W. Layton, Fultondale, both of Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed May 26, 1982, Ser. No. 382,014
Int. Cl.³ B27C 5/00
U.S. Cl. 144—136 R 4 Claims



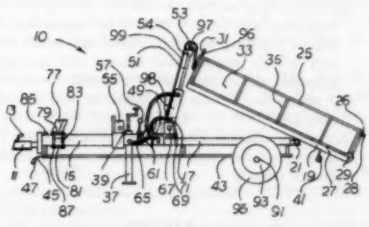
1. A contoured dunnage cutter for forming at least one arcuate concave cut at a predetermined location on at least one plane surface of a work piece; said dunnage cutter comprising a shaft mounted cutter head, a drive motor coupled to the shaft of said cutter head, said drive motor and said cutter head being mounted on a support plate, one edge of said support plate being pivotally mounted to a base, means to rotate said plate, motor and cutter head through a predetermined arc of about 120° with a reciprocal movement in and against the direction of the longitudinal axis of said work piece, and means for positioning one surface of said work piece in the arcuate path of said cutter head, said means for positioning including means for guiding said work piece, means for stopping said work piece at a predetermined location and means for holding down said work piece, whereby said cutter head is driven by means of said drive motor to form said arcuate concave cut in said work piece.

4,437,502

TRAILER MOUNTED LOG SPLITTER

Paul L. Staver, Box 74, Meriden, Iowa 51037

Filed Jan. 3, 1983, Ser. No. 455,216
Int. Cl.³ B27L 7/00; A47J 49/02
U.S. Cl. 144—193 A 17 Claims



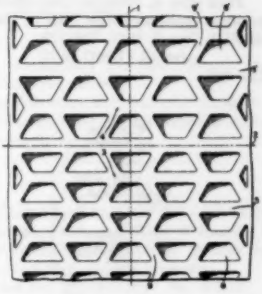
1. A trailer mounted log splitter comprising:
trailer means;
log-splitting means attached to the tongue portion of said trailer means;
trailer box means pivotally attached to said trailer means; and
means for operatively connecting said log-splitting means to said trailer box means for pivoting said trailer box means between raised and lowered positions.

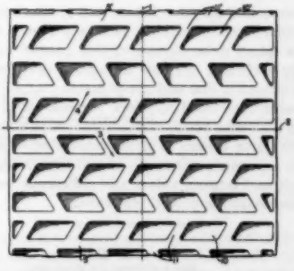
4,437,503

TREAD CONFIGURATION FOR PNEUMATIC VEHICLE TIRES

Hans Seitz, Langenhagen; Heinz-Dieter Rach, Garbsen; Henner Pieper, and Udo Frerichs, both of Langenhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,414
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139256
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.
Int. Cl.³ B60C 11/06, 11/08
U.S. Cl. 152—209 R 8 Claims





1. A tread configuration for the radially outwardly located peripheral surface of a pneumatic vehicle tire used as a spare tire to replace a regular tire that went flat, for example, said tread configuration comprising in combination:
transverse ribs respectively extending transverse to the circumferential direction of said tire; and
circumferential ribs at least some of which respectively extend at an angle to the circumferential direction of said tire, said circumferential ribs interconnecting said transverse ribs in such a way as to define a plurality of separate recesses therewith, with at least one boundary line of each of said recesses being formed by an edge of one of said transverse ribs; with the narrower dimension of each of said transverse and circumferential ribs being approximately ¼ to ⅓ of the circumferential dimension of an adjacent recess; the number of said transverse and circumferential ribs being such that, when viewed in the circumferential direction of said tire, several recesses are disposed next to one another, and a plurality of recesses are disposed one after the other; said peripheral surface of said tire being divided into at least two segments; within a given segment, the circumferential dimension of said recesses is constant, and the circumferential dimension of

said transverse ribs is constant, while the circumferential dimension of said recesses, and the circumferential dimension of said transverse ribs, of a given segment differ from those of a successive segment to obtain a high noise delivery, and especially to obtain a number of tones which very penetratingly affect the ears of the driver, such that said transverse ribs which are separated from each other by adjacent recesses are indispensible in the tread configuration in a need to cooperate and interact with each other accordingly.

4,437,504

TIRE-PRESSURE REGULATING SYSTEM

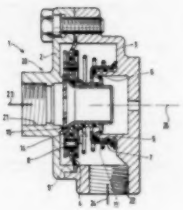
Werner Stumpe, Korawestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,580

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 8106194[U]; Dec. 9, 1981, 3148729

Int. Cl.³ B60C *29/00*

U.S. Cl. 152—427 **12 Claims**



1. A housed tire-pressure regulating system for varying the tire pressure of motor vehicles, said system having a tire-pressure control valve which is normally closed disposed on the vehicle wheel to be monitored said control valve being operated by a vehicle operator to control tire-pressure variation, characterized in that said tire-pressure control valve includes a seat valve controlled by work surfaces via a piston member having a closing body, said control valve further including a throttle valve means, said throttle valve means arranged to modify a pressure difference of said tire pressure which flows through said control valve, said difference being utilized for pressure-actuation of said seat valve.

4,437,505

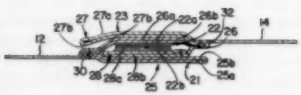
DRAPERY CLOSURE

Patricia Rodgers, 17291 Buttonwood, Fountain Valley, Calif. 92708

Filed Aug. 23, 1982, Ser. No. 410,380

Int. Cl.³ A47H *23/01*

U.S. Cl. 160—126 **4 Claims**



1. A drapery or curtain structure in combination with a securing means, comprising:

a drapery or curtain structure having at least two panels, thus defining a first and second panel positioned adjacent each other to provide adjoining vertical edges;

a first pleat formed along the adjoining edge of said first panel, said first pleat being defined by first and second parallel pleat sections integrally formed as part of said first panel, said first pleat section being formed by a first pair of folded members, and said second pleat section being formed by a second pair of folded members;

a second pleat formed along the adjoining edge of said second panel, said second pleat being defined by first and second parallel pleat sections integrally formed as part of said second panel, said first pleat section being formed by a first pair of folded members, and said second pleat section being formed by a second pair of folded members;

securing means comprising at least one male fastening member and at least one corresponding female fastening member, wherein one fastening member is mounted to said second pleat section of said first pleat and the other fastening member is mounted to said second pleat section of said second pleat, whereby said securing means is interposed within said pleats, wherein said second pleat section of said first pleat is interposed between said first and second pleat sections of said second pleat, and said second pleat section of said second pleat is interposed between said first and second pleat sections of said first pleat, whereby said adjacent vertical edges of said panels are joined substantially throughout their length.

4,437,506

CURTAIN DRAWER ARRANGEMENT

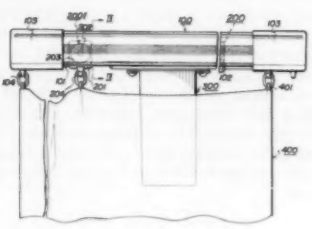
Koichi Ogita, Tokorozawa, Japan, assignor to Yokota Co., Ltd., Japan

Filed Aug. 6, 1981, Ser. No. 290,736

Claims priority, application Japan, Jul. 2, 1981, 56-102225

Int. Cl.³ A47H *1/00, 5/00*

U.S. Cl. 160—331 **6 Claims**



1. A curtain drawer arrangement comprising:

(a) a rail of generally inverted U-shape in vertical cross-section having a pair of tracks on the sides of a longitudinal opening, said U-shaped rail having therein a plurality of spaced, linearly extending conductors,

(b) a motor-driven mechanism comprising:

(i) a motor beneath said rail and having an output shaft,

(ii) a travelling portion in said rail having driven wheels engaging said pair of tracks, having resiliently urged means engaging said rail above said tracks for urging said wheels against said tracks, and having brushes engaging sad conductors in said rail,

(iii) means connecting said motor to said travelling portion, and

(iv) power transmission means including gears for transmitting power from said motor output shaft to said driven wheels.

4,437,507

MOLDING MACHINE

Robert J. Seeley, P.O. Box 4065, Elmira, N.Y. 14904

Filed Aug. 11, 1981, Ser. No. 292,034

Int. Cl.³ B22C *15/08, 25/00*

U.S. Cl. 164—173 **7 Claims**

1. A molding machine for producing molds, said machine comprising:

a frame;

a squeeze chamber assembly rotatably mounted in said

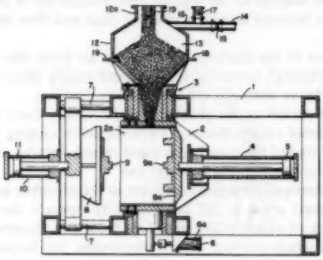
frame, said squeeze chamber assembly including a squeeze chamber flask in which respective molds are produced;

a first pattern mounting block associated with said squeeze chamber assembly and movable relative thereto and to said flask, said first pattern mounting block forming a first movable wall of said flask;

a first pattern mounted on said first pattern mounting block and facing said flask;

means associated with said squeeze chamber assembly for moving said first pattern and said first pattern mounting block relative to said flask and to said squeeze chamber assembly;

means associated with said frame for rotating said squeeze chamber assembly, said first pattern mounting block, said first pattern, and said means for moving same relative to said frame;



a second pattern mounting block operatively connected to said frame and movable relative thereto and into and out of said flask so as to form a second movable wall of said flask remote from said first movable wall or first pattern mounting block;

a second pattern mounted on said second pattern mounting block and facing said flask;

means associated with said frame and said second pattern mounting block for moving said second pattern and said second pattern mounting block relative to said frame and to said flask; and

a sand blow chamber assembly which is permanently connected with the squeeze chamber assembly, and has a blow chamber which is in communication with a source of sand and is in constant communication with said flask for supplying sand thereto.

4,437,508

CONTINUOUS LUBRICATION CASTING MOLDS

Michael J. Pryor, Woodbridge, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 84,768, Oct. 15, 1979, Pat. No. 4,363,352. This application Jul. 6, 1982, Ser. No. 395,163

The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.

Int. Cl.³ B22D *11/07*

U.S. Cl. 164—418 **13 Claims**

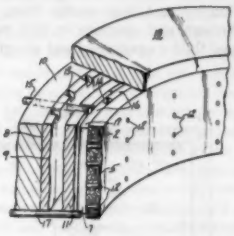
1. A casting apparatus for continuously casting molten metals or alloys comprising:

a continuous lubrication casting mold, said casting mold including a permeable casting mold section defining an inner casting surface and an outer lubricant receiving surface extending over substantially the entire length of said casting mold section;

said permeable casting mold section comprising a porous body having a continuous open pore fraction associated therewith for establishing passages for said lubricant;

said casting mold section further including a plurality of discrete, parallel-sided feed holes extending between said inner and outer surfaces for establishing additional passages for said lubricant; and

means for supplying said lubricant to said outer lubricant receiving surface comprising at least one chamber extending along substantially the entire length of said outer lubricant receiving surface;



whereby said lubricant continuously transfers from said passages onto said inner casting surface along substantially the entire length thereof.

4,437,509

METHOD FOR CONTROL OF BILLET STRIPPING

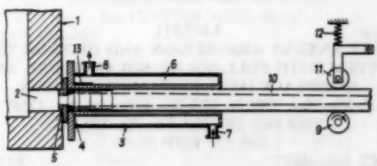
Max Ahrens, Irvine, Calif., and Manfred Haissig, Meerbusch, Fed. Rep. of Germany, assignors to Boehler Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 303,787

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037048

Int. Cl.³ B22D *11/16*

U.S. Cl. 164—454 **10 Claims**



1. A process for the control of the withdrawal of a casting from a cooled, horizontal, continuous casting mold composed of a material of elevated heat conductivity, which includes the steps of delivering metallic melt to the mold discontinuously, withdrawing the casting from the mold in a series of steps following formation of a casting skin, and, after each withdrawal step, pushing the casting back by a partial step, wherein the improvement comprises the steps of measuring the expansion or contraction of a wall of the mold in contact with the casting skin and controlling the withdrawal of the casting in response to the measured expansion or contraction.

4,437,510

HEAT PIPE CONTROL APPARATUS

Richard T. Martorana, Reading, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1982, Ser. No. 363,168

Int. Cl.³ F28D *15/00*; F28F *13/08*

U.S. Cl. 165—32 **1 Claim**

1. A heat pipe contro apparatus comprising:

an outer casing,

an inner casing inside of and spaced apart from said outer casing,

wick means positioned between said inner and outer casings,

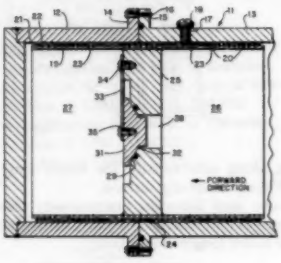
a plurality of holes in the periphery of said inner casing,

a separator in said inner casing dividing said inner casing into a heat input section and heat sink section,

an aperture in said separator,

a heat source,

a condensable fluid in said heat pipe and movable upon vaporization by said heat source from said heat input section through said aperture to said heat sink section wherein said fluid is condensed and absorbed by said wick means,



closure means for preventing vapor flow from said heat sink section through said aperture to said heat input section, said closure means comprising a stopper attached by a leaf spring to the side of said wall within said heat sink section whereby vapor flow from said heat input section through said aperture moves said stopper to open said aperture, and

said outer casing and said inner casing having means defining a capillary restriction seal in the space therebetween, said capillary restriction seal being located approximately midway between the ends of said inner casing.

4,437,511

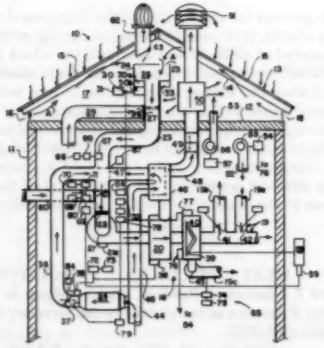
SOLAR ENERGY ABSORPTION AND DISTRIBUTION SYSTEM WITH FULL SOLAR, SOLAR ASSIST, AND FIREPLACE HEAT EXCHANGER MODES

John P. Sheridan, 5008 N. 35th St., Arlington, Va. 22207

Filed Dec. 23, 1980, Ser. No. 220,237

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—485 **3 Claims**



1. A system for controlling the environment in a building via a combination of air pre-heating and pre-cooling means automatically controlled and programmed by energy sensing devices integrated into a single system, said building having a roof exposed to solar radiation and forming the upper surface of a chamber containing a body of air which is heated by solar energy impinging on the roof, said roof and chamber configured to define an upper region of the chamber to which the solar heated air in the chamber rises, said system comprising:

a conventional heating and air conditioning system in the building, including a furnace with an evaporator, blower means, and air distribution and air return ducting leading to and from enclosed areas of the building;

an elongate collector duct in the upper region of the chamber extending lengthwise of the chamber and having a longitudinally extending slot therein for entry of the solar pre-heated air from the chamber into the collector duct;

a supply duct having an inlet connected with the collector duct for supplying solar pre-heated air to the air return ducting of the conventional heating system for distribution of the heated air to the enclosed areas;

said slot in the collector duct having a cross-section greater than the cross-section of the inlet to the supply duct to insure that all of the highest temperature air in the chamber is induced into the collector duct and thus the supply duct;

a blower in the ducting for drawing air from the chamber and through the collector duct and supply duct and forcing the air through the distribution ducting;

damper means at the juncture of the supply duct and conventional return ducting for selectively closing off flow from one of the supply duct and return ducting and opening the other to the blower; and

thermostatically controlled means in the chamber and in the enclosed areas to (a) automatically operate the damper means to admit solar heated air from the chamber to the distribution ducting and to deenergize the furnace when the temperature of the solar heated air in the chamber is above a first predetermined value, (b) admit air from the conventional air return ducting while precluding flow of air from the collector duct and to energize the furnace when the temperature is below a second predetermined value, and (c) admit solar heated air from the chamber through the air return ducting directly to the furnace and to energize the furnace when the temperature of the solar heated air in the chamber is between said predetermined values.

4,437,512

HEAT EXCHANGER ASSEMBLY

Robert F. DeVore, Dallas, Tex., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Nov. 24, 1982, Ser. No. 444,341

Int. Cl.³ F24F *13/08*

U.S. Cl. 165—122 **18 Claims**

1. A heat exchanger assembly for air-cooled heat exchanging and having a top, a bottom, a front end, a back end, a right side and a left side:

(a) a plurality of air flow units arranged and supported in a longitudinal end-to-end assembly, each air flow unit including the following associated components:

(i) a substantially vertical fan mounting wall having a hole therein;

(ii) a fan mounted for rotation in said hole,

(iii) a venting wall operative to direct air blown backwardly by said fan up and out said top, said venting wall situated in back of said fan mounting wall and including right and left portions and an inclined portion extending from adjacent the bottom of said fan mounting wall to the top of said heat exchanger,

(iv) right and left air inlets situated in front of said fan mounting wall,

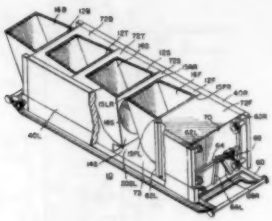
(v) an air inlet zone between said right and left air inlets from which air is drawn to said fan, through said hole, and into a venting zone defined by said venting walls, and

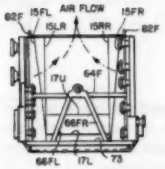
(vi) a bottom wall portion closing off the bottom of said air inlet zone,

(b) right and left heat exchangers extending lengthwise

along said heat exchanger assembly and respectively covering said right and left air inlets of said air flow units and respectively covering said right and left portions of said venting wall of at least one of said air flow units,

(c) a support supporting said air flow units and said heat exchangers, and





(d) coupling means for coupling said fans together for rotation in unison and in parallel and wherein said fans are adapted to cause air flow through said right and left heat exchangers into said air inlet zones by way of said right and left air inlets, through said holes into said vent zones and out the top of said vent zones and wherein said right and left portions of the venting walls of more than one of said air flow units are tapered inwardly and backwardly.

4,437,513

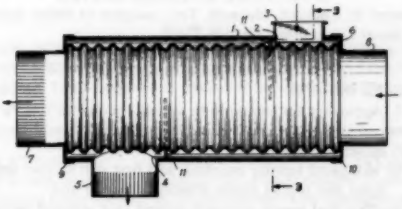
HEAT RECOVERY APPARATUS

Joseph Castiglioni, 80 Stavola Rd., and Paul Rosenthal, 143 Woodgate Rd., both of Middletown, N.J. 07748

Continuation of Ser. No. 911,975, Jun. 2, 1978, abandoned. This application Jan. 20, 1982, Ser. No. 341,139

Int. Cl.³ F28D *5/00*; F28F *1/42*

U.S. Cl. 165—154 **8 Claims**



1. A combustion discharge system wherein: A heat recovery apparatus for flue gas is connected at an end section thereof to a gas furnace at the discharge pipe of the gas furnace and is connected at the opposite end section thereof to a section of flue apparatus, said heat recovery apparatus comprising:

(a) An encapsulating galvanized outer wrapping having

(i) an opening which receives an air supply blowing device near the end section connected to the discharge pipe of the gas furnace and

(ii) an air discharge opening 180° apart from said opening which receives the air supply blowing device and near the opposite end section connected to the section of flue apparatus;

(b) An inner corrugated galvanized sheet metal flue core wherein

(i) the corrugated section of said flue core is encapsulated with means to effect closure with said outer wrapping and said flue core which is substantially free from direct contact along substantially its entire longitudinal extent with the inside surface of said outer wrapping and

(ii) said inner core has non-corrugated end sections protruding beyond each end of said encapsulating outer wrapping, one of said non-corrugated end sections being said end section connected to the discharge pipe of the gas furnace and the other non-corrugated end section being said end section connected to the section of flue apparatus, thereby fitting said heat recovery apparatus into said combustion discharge system; and

(c) at least a pair of semicircular baffles mounted in valleys of the corrugations of said inner core,

each spaced one from the other along the axial length of the corrugations and each being on the opposite side from one another,

the peaks of said baffles being in contact with the inner surface of said outer wrapping and substantially parallel to the openings in said outer wrapping to thereby permit unidirectional flow of air over the entire corrugated surface,

said at least one pair of baffles being respectively positioned near the opening which receives the air supply blowing device and the air discharge opening.

4,437,514

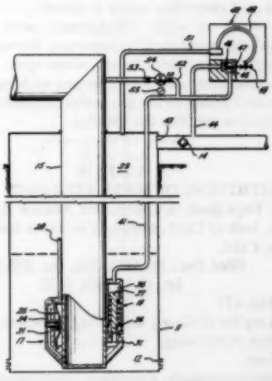
DEWATERING APPARATUS

Carlos R. Canalizo, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 17, 1982, Ser. No. 389,259

Int. Cl.³ E21B *34/16, 43/12*

U.S. Cl. 166—53 **5 Claims**



1. A system for controlling operation of a fluid operated gas lift valve having a pressure dome for lifting liquids in a tubing located in a cased gas well producing through the casing-tubing annulus and through a gas outlet at the wellhead comprising:

a controller having a cooperable valve and valve seat therein controlling flow from the gas outlet of the well to the pressure dome of the gas lift valve;

means in said controller responsive to casing-tubing annulus pressure for opening said valve in response to annulus pressure reducing to a selected value and closing said

valve in response to annulus pressure rising to a selected value;

regulator means controlling pressure in said pressure dome when said controller valve is closed;

choke means in series arrangement with said regulator means and positioned downstream thereof limiting flow through the regulator means when open;

means connecting said choke means with said tubing; and

check valve means in the gas outlet preventing back flow of production gas into the annulus.

2. A dewatering system for a cased gas well having a tubing located therein and producing through the casing-tubing annulus and through a gas outlet at the wellhead comprising:

a diverter valve for diverting liquids from the well into the tubing comprising,

a housing having a flowway therethrough with its outlet communicating with said tubing,

a cooperable valve member and valve seat controlling flow through the flowway,

a pressure responsive member exposed on one side to pressure exterior of the housing and controlling operation of said valve member in response to changes in pressure exterior of the housing, and

means effective on the other side of and urging said pressure responsive member towards valve closed position with a constant force sufficient to maintain the valve member closed when the liquid exterior of the tubing drops below a selected level to prevent lifting gas passing through the diverter valve;

a fluid operated gas lift valve having a pressure dome and having its outlet connected to the tubing for gas lifting liquids diverted to said tubing by said diverter valve; and

a control system comprising;

a controller having a cooperable valve and valve seat therein controlling flow from the gas outlet from the well to the pressure dome to the gas lift valve,

means in said controller responsive to casing-tubing annulus pressure for opening said valve in response to annulus pressure reducing to a selected value and closing said valve in response to annulus pressure rising to a selected value,

regulator means controlling pressure in said pressure dome when said controller valve is closed,

choke means in series arrangement with said regulator means and positioned downstream thereof limiting flow through the regulator means when open,

means connecting said choke means with said tubing, and

check valve means in the gas outlet preventing back flow of production gas into the annulus.

4,437,515

POSITIONING OF WELL PIPE JACK IN A RIG

George I. Boyadjieff, Anaheim, and Andrew B. Campbell, San Marino, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Filed Dec. 21, 1981, Ser. No. 333,111

Int. Cl.³ E21B *7/20*

U.S. Cl. 166—77 **15 Claims**

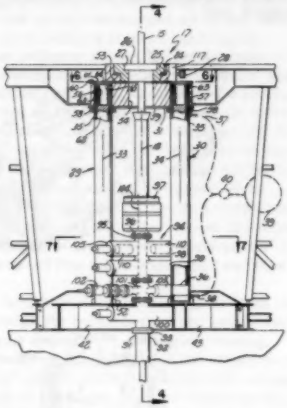
10. In a rig for drilling a well along a predetermined axis, the combination comprising:

a rig floor;

a tubular mousehole extending downwardly beneath the level of the rig floor and generally parallel to said axis at a location offset in a predetermined horizontal direction therefrom and adapted to receive and hold a section of pipe which is to be added to or has been removed from a drill string;

jacking mechanism for moving a well casing along said axis and including first and second pipe supporting units at least one of which is accessible above the rig floor and a plurality of structures extending downwardly beneath the level of said rig floor at different sides of said axis, said structures including power operated piston and cylinder mechanisms for moving one of said pipe supporting units upwardly and downwardly relative to the other in a relation jacking a well casing downwardly along said axis; and

at least one blowout preventer beneath said rig floor operable to close off unwanted upward flow of well fluid from



the well and having a portion which projects laterally outwardly away from said axis at a location circularly between said mousehole and one of said structures of the jacking mechanism.

4,437,516

COMBINATION RELEASE MECHANISM FOR DOWNHOLE WELL APPARATUS

Darryl W. Cockrell, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 3, 1981, Ser. No. 270,085

Int. Cl.³ E21B *33/12, 23/00*

U.S. Cl. 166—120 **18 Claims**

1. Apparatus for insertion in a well conduit to form a seal between said conduit and a member disposed in said conduit, said apparatus comprising:

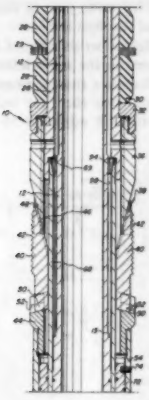
an elongated tubular mandrel, and first and second spaced apart seal urging means disposed therearound;

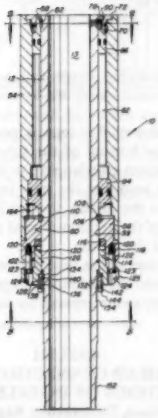
resilient seal means disposed around said mandrel between said seal urging means;

at least one of said seal urging means being axially movable with respect to said mandrel and said other seal uring means to force said seal means radially outwardly into forcible engagement with said conduit; and

means interconnecting said mandrel with said seal urging means, said interconnecting means including release means responsive to selective application of an axial force on said mandrel or rotation of said mandrel to effect relative movement of said mandrel to release said seal means

from forcible engagement with said conduit, said release means being movable relative to said mandrel and said seal





urging means to adjust the amount of axial force or rotation for effecting release of said seal means.

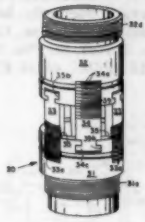
4,437,517

SLIP MECHANISM FOR SUBTERREANEAN WELLS

David C. Bianchi, Conroe, and Talmadge L. Crowe, Houston, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Oct. 2, 1981, Ser. No. 307,972
Int. Cl.³ E21B *33/128*; E21B *33/129*
U.S. Cl. 166—120 **17 Claims**

3. A tool operatively connected to an inner conduit received within an outer conduit in a subterranean well having means for anchoring said tool to said outer conduit to prevent axial movement in both directions, said tool comprising: a set of peripherally spaced, radially expandable first slip elements for engaging the outer conduit to prevent movement in a first direction and a set of peripherally spaced, radially expandable second slip elements for engaging the outer conduit to prevent movement in a second opposite direction; first and second housing elements movable relatively towards each other; means for urging said first and second slip members radially outward into engagement with said outer conduit upon movement of said first and second housing elements relatively towards each other; a member in abutting relationship with said first housing element to urge said first housing element in a first direction toward said second housing element; means for preventing axial movement of said member relative to said second housing element in a second opposite direction; and means for attaching said first slip elements to said second



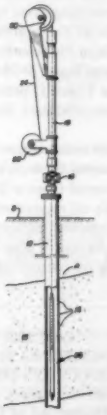
housing element so that said first slip elements upon engagement with the outer conduit prevent said second housing element from moving in said first direction with said member when said member moves in said first direction whereby said second slip elements will not be dislodged from engagement with said outer conduit.

4,437,518

APPARATUS AND METHOD FOR IMPROVING THE PRODUCTIVITY OF AN OIL WELL

Albert V. Williams, Los Angeles, Calif., assignor to Norman Gottlieb and Aileen Williams, both of Long Beach, Calif.

Filed Dec. 19, 1980, Ser. No. 218,294
Int. Cl.³ E21B *43/24*, *43/25*
U.S. Cl. 166—248 **14 Claims**



1. A method of increasing the productivity of an oil well comprising:

lowering an excitation apparatus through the casing of said well to a level at which said apparatus is submerged in oil;

causing said apparatus to emit ultraviolet radiation into the surrounding oil; and

causing said apparatus to vibrate mechanically, thereby providing a mechanical energy input to said oil.

9. An apparatus for treating an oil well to increase its productivity comprising:

resonator means for producing mechanical vibrations in response to one or more input signals of selected frequen-

cies and thereby providing a mechanical energy input to surrounding oil; and

radiation means including a gas discharge tub for emitting radiation into the surrounding oil.

4,437,519

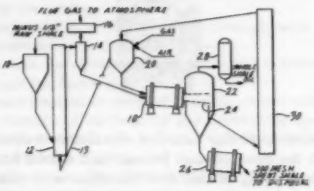
REDUCTION OF SHALE OIL POUR POINT

Chang Y. Cha, and Harry E. McCarthy, both of Golden, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 3, 1981, Ser. No. 269,987

Int. Cl.³ E21B *43/247, 43/34*; C10G *1/02*

U.S. Cl. 166—259 **14 Claims**



2. A method for lowering the pour point of shale oil produced from a Tosco II retorting process, the method comprising:

blending with such a Tosco II process-produced shale oil a crude shale oil recovered from in situ retorting of oil shale in a subterranean in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale by advancing a combustion zone through the fragmented mass by introducing an oxygen-supplying gas to the fragmented mass on the trailing side of the combustion zone and withdrawing an off gas from the fragmented mass on the advancing side of the combustion zone, whereby gas flowing through the combustion zone tranfers heat of combustion to a retorting zone in the fragmented mass on the advancing side of the combustion zone and wherein kerogen in oil shale in the retorting zone is decomposed to produce gaseous and liquid products including crude shale oil, the ratio of the Tosco II process-produced shale oil to the in situ process-produced shale oil being no greater than 1:1.

4. A blended shale oil composition comprising in admixture a crude shale oil recovered from an in situ oil shale retort and a crude shale oil recovered from a Tosco II retorting process wherein the crude shale oil recovered from an in situ oil shale retort is present in an amount sufficient for forming a blended shale oil composition having a pour point less than the pour point of the crude shale oil recovered from the in situ oil shale retort.

4,437,520

METHOD FOR MINIMIZING SUBSIDENCE EFFECTS DURING PRODUCTION OF COAL IN SITU

Xerxes T. Stoddard, Denver; Vesper A. Vasseen, Wheat Ridge, and Ruel C. Terry, Denver, all of Colo., assignors to In Situ Technology, Inc., Golden, Colo.

Filed Jun. 15, 1981, Ser. No. 273,378

Int. Cl.³ E21B *33/138, 43/247*

U.S. Cl. 166—261 **4 Claims**

1. In production of coal in situ wherein at least a pair of wells has been drilled from the surface of the earth into an underground coal seam and a first linkage channel has been established through the coal thus connecting the wells; and wherein the coal has been set afire with combustion sustained by injecting an oxidizer into a first well of the pair and removing the products of reactions through the second well of the pair; wherein as combustion proceeds and the georeactor grows in lateral extent resulting in roof fall and subsidence; and wherein during the course of production the burn preferentially moved to a second linkage channel at the top of the coal seam:

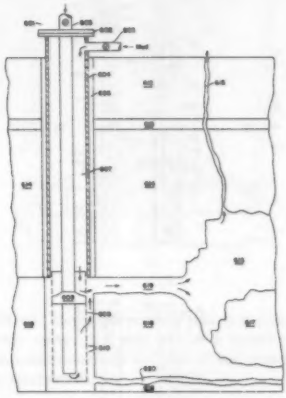
a method of sealing the georeactor comprising the steps of

establishing a mud injection pipe at the surface of the earth into the casing of the first well,

affixing a mud deflector to a string of tubing,

affixing a mud screen to the mud deflector, the mud screen being of lesser diameter than the casing,

lowering the tubing into the first well wherein the mud deflector is positioned adjacent to the second linkage



channel and the mud screen is positioned from a point adjacent to the bottom of the tubing and extending upward to a position overlapping with the casing,

injecting sealant mud into the mud injection pipe,

injecting gas into the tubing, the gas being under a pressure less than that of the column of mud in the annulus between the tubing and the casing,

continuing injection of gas with the resultant gas drive forcing the mud into the second linkage channel and into the connected void space created by subsidence.

4,437,521

SUBSEA WELLHEAD CONNECTION ASSEMBLY AND METHODS OF INSTALLATION

Emmett M. Richardson, Duncanville; Angelos T. Chatas, Dallas, and Joseph R. Padilla, Houston, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,901

Int. Cl.³ E21B *43/01*

U.S. Cl. 166—341 **17 Claims**

1. A subsea wellhead connection assembly for establishing fluid communication and production capability between a manifold system situated within a subsea work enclosure and an adjacent subsea wellhead located in a generally wedge-shaped well bay, comprising:

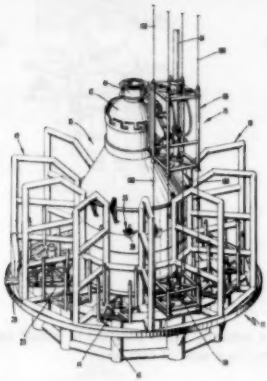
conduit means for fluidly connecting the wellhead and the manifold system, the conduit means having one end extending substantially horizontally and the other end extending downwardly;

wellhead connector means fluidly connected to the downwardly directed end of the conduit means for releasably connecting the conduit means to the wellhead upon downward movement of the assembly to establish fluid communication therebetween;

manifold system connector means fluidly connected to the horizontal end of the conduit means for releasably connecting the conduit means to the manifold system upon lateral movement of the manifold system connector means to establish fluid communication therebetween; and

a guide frame rigidly secured to the wellhead connector

means for supporting the manifold system connector means and the conduit means, and for vertically orienting the wellhead connector means over the wellhead and horizontally aligning the manifold system connector means with the manifold system, wherein the wedge-shaped well bay is defined by rigid vertical dividers supported on the marine floor, the vertical dividers extending along radially aligned planes so as to define opposite sides



of a radially inwardly tapered well bay, and wherein the wedge-shaped sides of the guide frame are tapered similarly to the tapered well bay sides and said sides of the guide frame are sufficiently spaced apart and extend for a sufficient length and height to provide alignment of the guide frame as it is moved laterally during installation for orientation of the wellhead connection assembly over the wellhead.

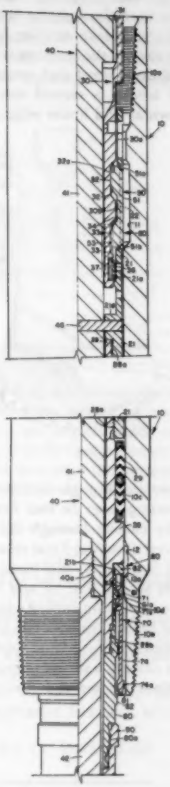
4,437,522

SELECTIVE LOCK FOR ANCHORING WELL TOOLS

William F. Krause, Jr., Spring, and Mark E. Hopmann, Houston, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 8, 1982, Ser. No. 346,674
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—382 **22 Claims**

1. A lock for securing a well tool in a selected one of a plurality of identical landing nipples in a well conduit, said lock comprising: an annular housing having means thereon for supporting said well tool; a plurality of radially expandable locking dogs for engaging said nipple to secure said well tool thereto when subjected to axial loads in either direction; an outwardly urged inwardly collapsible means engagable with said nipple upon outward expansion to prevent movement of said annular housing in a first axial direction relative to said nipple; an axially shiftable member movable in said first axial direction relative to said annular housing from a position initially in compressive engagement to hold said collapsible means in an inwardly retracted position and having means for engaging said nipple during movement of said lock in a second opposite axial direction to release said collapsible means; and camming means for outwardly urging said radially expandable locking dogs, said camming means being shiftable in said first



direction relative to said annular housing upon engagement of said collapsible means with said nipple.

4,437,523

LAWN EDGING DEVICE

Joe A. Isbell, 837 Argus, Milan, Tenn. 38358

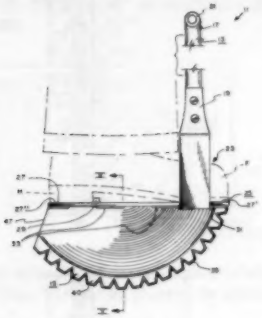
Filed Mar. 30, 1982, Ser. No. 363,653
Int. Cl.³ A01B *1/24*
U.S. Cl. 172—13 **1 Claim**

1. A device for edging lawns around concrete walkways, said device comprising:

(a) An elongated handle member having a first end and a second end, said first end including a grip portion for allowing the operator of said device to securely grip said handle member, said second end having an aperture therethrough for allowing the operator of said device to extend his foot therethrough;

(b) an anvil means attached to said second end of said handle member for receiving the foot of the operator of said device, said anvil means including a generally flat upper surface having a forward end and a rearward end and shaped so as to receive the entire bottom of the foot of the operator of said device, said upper surface of said anvil means having a longitudinal axis, said anvil means having a raised, transverse member attached to said upper surface substantially adjacent the rearward end thereof for engaging the heel of the foot of the operator of said device; and

(c) a blade member having an upper edge for being attached to said anvil means substantially in line with said longitudinal axis of said upper surface of said anvil means and having a curved lower edge for being forced downward and rotated forward through the lawn adjacent the concrete walkway, said blade member having a first side for being directed toward the concrete walkway as said lower edge is forced downward and rotated forward through the lawn and having a second side for being directed against the lawn as said lower edge is forced downward



and rotated forward through the lawn, said blade member including a cutting edge on said first side adjacent said lower edge for cutting through the lawn as said blade member is forced downward and rotated forward through the lawn, said first side of said blade member being concaved and said second side of said blade member being convexed for causing said cutting edge of said blade member to be urged against the concrete walkway as said blade member is forced downward and rotated forward through the lawn, thus causing a slicing scirrors action, said lower edge of said blade member being serrated.

4,437,524

WELL DRILLING APPARATUS

George I. Boyadjieff, Anaheim, and Joseph A. R. Picard, Fountain Valley, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Continuation of Ser. No. 167,758, Jul. 14, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 350,081

Int. Cl.³ E21C *11/00*

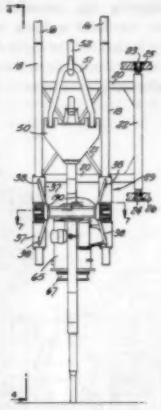
U.S. Cl. 173—43 **22 Claims**

9. Well drilling apparatus comprising:

a drilling unit including an element adapted to be connected to the end of a drill string for rotation therewith about the axis of the string, and a motor operable to drive said element and the connected string rotatively about said axis; and

means movably mounting said drilling unit and including an elongated guide structure which extends essentially parallel to said axis and which in a predetermined drilling position of the unit guides it for movement along said axis relative to said guide structure;

said mounting means including a connection mounting a first portion of said elongated guide structure, carrying said drilling unit, for movement with the drilling unit relative to a second portion of the guide structure in a relation shifting said drilling unit between said drilling position



and a laterally offset position in which said drilling unit is shifted to a side of said axis.

4,437,525

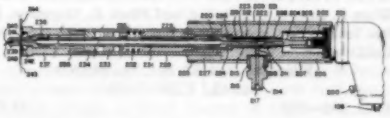
HAND HELD WATER DRILLING APPARATUS

Tom A. O'Hanlon, Tacoma; Peter L. Madonna, Redmond, and Gearld F. Wallace, Federal Way, all of Wash., assignors to Flow Industries, Inc., Kent, Wash.

Filed Jul. 6, 1981, Ser. No. 280,797

Int. Cl.³ E21B *7/18*

U.S. Cl. 175—218 **9 Claims**



1. A drill for drilling hard materials comprising:

an inlet connectable to a source of high pressure fluid; and,

a high pressure swivel connected to said inlet for allowing rotation relative to said inlet; and,

a nozzle for forming high pressure cutting jets when supplied with high pressure fluid; and,

a supply tube connecting said high pressure swivel and said nozzle for supplying said nozzle with high pressure fluid; and,

motor means for rotating said nozzle; and

flushing means for removing chips from any hole bored by said drill; and,

means connecting said flushing means to the outside of said supply tube.

4,437,526
MILLING TOOL FOR FORMING RECESSES IN MASONRY, CONCRETE AND SIMILAR MATERIAL STRUCTURES

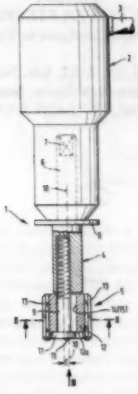
Peter Gloor, Zollikerberg, Switzerland, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 3, 1981, Ser. No. 327,045

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1980, 3046190

Int. Cl.³ E21B *9/24*

U.S. Cl. 175—346 **8 Claims**



1. Milling tool for forming a recess, such as an undercut in a borehole, in structures made of masonry, concrete and similar materials, comprising an axially elongated tool shaft, a milling head mounted on said tool shaft, said milling head having cutting edge members located on the outside surface thereof, wherein the improvement comprises an axially elongated bearing pin extending axially outwardly from said tool shaft with the axis thereof disposed parallel to and offset laterally from the axis of said tool shaft, said milling head is mounted on an extends around said bearing pin outwardly from said tool shaft and said milling head is freely rotatable about said bearing pin, said milling head has a bore formed therein into which said bearing pin fits, the diameter of the bore in said milling head being greater than the outside diameter of said bearing pin, and the point on said bearing pin spaced most remote from the axis of said tool shaft defining, during rotation of said tool shaft, an envelope curve which projects beyond the cross-section of the bore within said milling head at least at one location, the dimension of the eccentricity of the axis of said bearing pin relative to the axis of said tool shaft is in the range of 5 to 25% of the working diameter of said milling head defined by the outside diameter of the cutting edge members on said milling head.

4,437,527
COMBINATION WEIGHING MACHINE

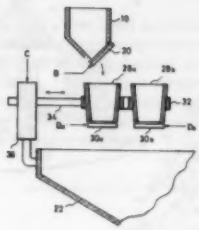
Michinobu Omae, Akashi, and Takashi Hirano, Kobe, both of Japan, assignors to Yamato Scale Company, Ltd., Hyogo, Japan

Filed Jul. 19, 1982, Ser. No. 399,326

Int. Cl.³ G01G *19/32*

U.S. Cl. 177—25 **3 Claims**

1. A combination weighing machine comprising a plurality of weighing units each weighing a plurality of articles and producing weight signals indicative of the weights thereof respectively, a common collecting chute, and a combination selecting circuit for receiving said weight signals, summing them in accordance with predetermined mathematical combinations and electing a specific combination providing a sum which satisfies a predetermined condition, each of said weighing units including a single weighing cradle, at least two holding hoppers, memories corresponding to said holding hoppers respectively, means for distributing the content of said cradle to each of said hoppers, and means for writing the weight signal corresponding to the content of said cradle into each of said memories before said content is distributed to said hopper, said combination selecting circuit including a circuit for producing a set of output signals which specify said memories which have provided those weight signals constituting said combination satisfying said predetermined conditions, and said machine further including first gating means for responding to said output signals to discharge the contents of said holding hoppers corresponding to said specified memories into said collecting chute.



4,437,528
VEHICLE WITH VARIABLE UNDERCARRIAGE GEOMETRY

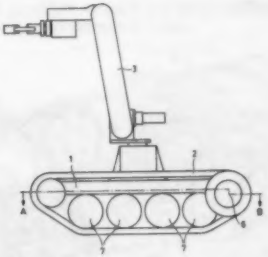
Wolfgang Koehler, Karlsruhe; Hans-Joachim Blocher, Metzingen, and Eberhard Weiss, Pfullingen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 387,971

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146661

Int. Cl.³ B62D *55/00*

U.S. Cl. 180—9.5 **4 Claims**

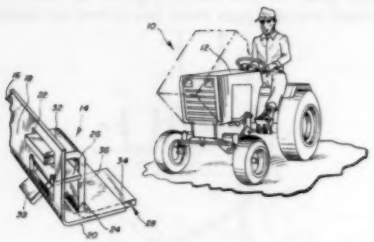


1. A vehicle with variable undercarriage geometry, comprising: a vehicle body, at least two elongated undercarriage support beams pivotally linked to said body, each having propulsion means associated therewith, a pivot motor mounted on said vehicle body and extending into said undercarriage coaxially with the pivoting axis of the associated support beam and being operatively connected to the associated support beam for pivoting said support beam, and a drive motor mounted on said support beam and having an output operatively associated with said propulsion means for operating said propulsion means to propel said vehicle, both pivot and drive motors being disposed essentially within the outline of said undercarriages.

4,437,529
DETACHABLE HINGE ASSEMBLY

Mark R. Fralish, Bertin, Wis., assignor to Ingersoll Equipment Co., Inc., Winnecoune, Wis.

Filed May 3, 1982, Ser. No. 373,870
Int. Cl.[3] B62D *25/10*
U.S. Cl. 180—69 C 8 Claims

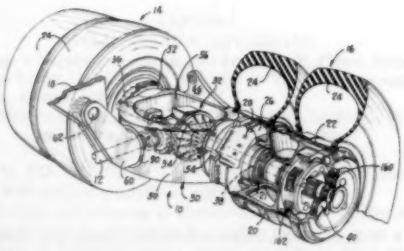


5. A detachable hinge assembly for mounting a hood relative to the frame of a tractor comprising a first, generally L-shaped member secured to the hood, a second, generally Z-shaped member secured to the frame of the tractor, said L-shaped member defining an opening in its vertical leg portion and a second opening in its horizontally extending leg portion, said Z-shaped member comprising a first leg extending into the opening of said upwardly extending leg portion of the first member and a second leg disposed through the opening in said second leg portion of the first member, the openings in said L-shaped member and the corresponding leg portions in said Z-shaped member being defined so that the movement of the hood is restricted in the upper and sidewise directions relative to the frame member of the tractor.

4,437,530
VEHICLE AXLE ASSEMBLY

Simon A. De Young, Lyndhurst, and Charles C. Gray, Chardon, both of Ohio, assignors to Euclid, Inc., Cleveland, Ohio

PCT No. PCT/US81/00094, § 371 Date Jul. 16, 1982, § 102(e) Date Jul. 16, 1982
PCT Filed Jan. 26, 1981, Ser. No. 417,764
Int. Cl.[3] B60B *35/16*; F16H *35/00*
U.S. Cl. 180—75 17 Claims

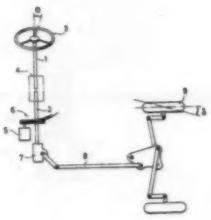


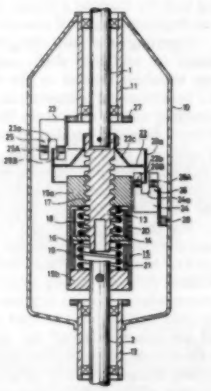
8. A driving axle assembly comprising:
(a) a differential mechanism;
(b) first and second axle shafts driven from said differential mechanism and projecting therefrom;
(c) first and second spindle assemblies surrounding and supporting respective projecting portions of said first and second axle shafts;
(d) a housing frame disposed between and fixed to said spindle assemblies, said housing frame defining a differential mechanism receiving opening within which said differential mechanism is disposed, said opening oriented in a direction transverse to the directions of extent of said axle shafts and support structure for supporting said differential mechanism on said housing frame; and,
(e) connecting means for detachably securing said differential mechanism to said housing frame.

4,437,531
ELECTRICAL POWER STEERING SYSTEM

Sumio Urabe, Shiga, Japan, assignor to Toyo Umpanki Co., Ltd., Osaka, Japan

Filed Mar. 29, 1982, Ser. No. 362,793
Claims priority, application Japan, Sep. 25, 1981, 56-152407
Int. Cl.[3] B62D *5/04*
U.S. Cl. 180—79.1 11 Claims



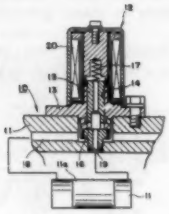


1. An electrical power steering system comprising:
a steering wheel;
a first shaft having an axis and coupled to said steering wheel for rotation therewith;
a second shaft axially aligned with said first shaft;
coupling means for coupling said first and second shafts for at least limited relative rotation from a neutral position with respect to one another;
linearly movable means for moving linearly in response to relative rotation of said first and second shafts from said neutral position;
detection means for detecting the amount of linear movement of said linearly movable means and providing a detection signal proportional to the amount of said linear movement; and
servo means responsive to said detection signal for rotating said second shaft until said neutral position is obtained.

4,437,532
STEERING FORCE CONTROLLER FOR A POWER STEERING DEVICE

Kelichi Nakamura, Kariya; Kyosuke Haga, Anjo, and Yutaka Mori, Toyokawa, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 29, 1982, Ser. No. 393,350
Claims priority, application Japan, Jul. 13, 1981, 56-109644
Int. Cl.³ B62D *5/06*
U.S. Cl. 180—142 **8 Claims**



1. A steering force controller for a power steering device having a fluid control system, comprising:

a linear solenoid valve provided in said fluid control system of said power steering device for controlling an output torque relative to an input torque;

an input torque sensor for detecting a value of said input torque applied to said power steering device;

an output torque sensor for detecting a value of said output torque generated by said power steering device;

auxiliary input sensing means for detecting a value of at least one auxiliary control input;

control circuit means connected to said input torque sensor, said output torque sensor and said auxiliary input sensing means for obtaining an objective output torque value based upon said input torque value and said at least one auxiliary control input value and further, for calculating a control output value based upon said objective output torque value and said detected output torque value; and

solenoid drive means connected to said control circuit means and said linear solenoid valve for controlling said linear solenoid valve in response to said control output value applied from said circuit means, whereby said output torque generated by said power steering device is controlled to follow said objective output torque value.

4,437,533
SYSTEM FOR MONITORING THE COURSE AND FOR CONTROLLING THE BRAKING OF A FREELY MOVABLE VEHICLE, PARTICULARLY AN INDUCTIVELY STEERED VEHICLE, AND VEHICLE WITH SUCH A SYSTEM

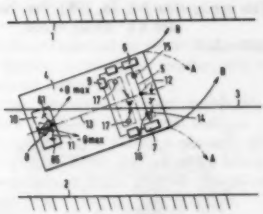
Hartwig Bierkarre, Hamburg; Gottfried Klinger, Bad Bramstedt; Jürgen Radeloff, Norderstedt, and Bernd-Hendrik Rust, Kayhude, all of Fed. Rep. of Germany, assignors to Firma Jungheinrich Unternehmensverwaltung KG, Hamburg, Fed. Rep. of Germany

Filed Jan. 12, 1982, Ser. No. 338,904
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110499
Int. Cl.³ B62D *1/24*
U.S. Cl. 180—168 **22 Claims**

1. In a circuit arrangement for initiating an emergency braking operation of a vehicle traveling along a guideline which extends at the center of a path defined by obstacles on at least one side, which vehicle comprises a steerable driven wheel, means defining a maximum steering angle for said driven wheel, travel drive means for driving said driven wheel, braking means arranged to effect an emergency braking of said vehicle within a predetermined maximum emergency stopping distance in response to the delivery of an emergency braking signal to said braking means, and a sensor which has first and second sensor output terminals and is operable to deliver at said first sensor output terminal an angular misalignment signal representing the angle between the longitudinal axis of the vehicle and said guideline and to deliver at said second sensor output terminal an actual departure signal representing the actual lateral departure of a predetermined point of the longitudinal center line of the vehicle from said guideline,

the improvement residing in that said circuit arrangement comprises

a processor having a first input terminal adapted to be connected to said first sensor output terminal, a second input terminal adapted to be connected to said second sensor output terminal, a third input terminal, and a constant-defining circuit defining a constant which depends on the contour of said vehicle in plan view and on said maximum emergency stopping distance,



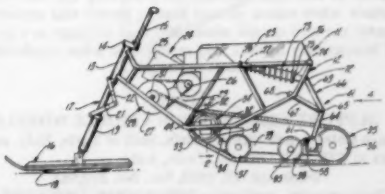
a maximum departure signal generator connected to said third input terminal and operable to deliver to said third input terminal a maximum departure signal representing a maximum lateral departure of a predetermined point on said longitudinal center line from said guideline in dependence on said maximum steering angle and the width of said path of travel

said processor being operable to compute a maximum permissible lateral departure of said predetermined point of said longitudinal center line from said guideline in dependence on said actual lateral departure signal, said maximum departure signal, said angular misalignment signal, and said constant, and to deliver to said braking means said emergency signal when said maximum permissible lateral departure exceeds said actual lateral departure by less than a predetermined value.

4,437,534
SNOW VEHICLE

James E. Grinde, Anoka, Minn., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 8, 1982, Ser. No. 346,946
Int. Cl.³ B62M *27/02*
U.S. Cl. 180—190 **36 Claims**



1. A small, lightweight vehicle having frame means, a front ski supported for steering movement by said frame means, an endless driving belt, power means, carried by said frame means for driving said driving belt, said driving belt having a drive

portion thereof positioned for engaging the terrain over which said vehicle is operated for driving said vehicle therealong, the improvement comprising suspension means for supporting said drive belt and said frame means for relative pivotal movement about an axis that extends generally longitudinally of said frame means so that an operator may lean said frame means relative to said driving belt without changing the area of engagement between said driving belt and the terrain, said axis being defined by a pair of spaced pivot points that lie within the area encompassed by said drive belt.

4,437,535

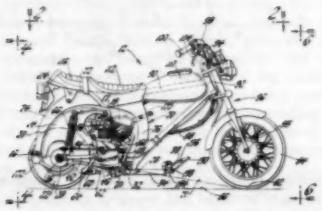
THREE-TRACK MOTORCYCLE WITH CAMBERING MAIN FRAME

Frank J. Winchell, Orange Lake, and Klaus O. Winkelmann, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 182,751, Aug. 29, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 402,220

Int. Cl.³ B62D *61/08*

U.S. Cl. 180—215 **7 Claims**



1. A three-wheel cambering vehicle comprising a front steering fork assembly rotatable about an inclined steering axis, a steerable front road wheel mounted on the lower extremity of said fork assembly for rotation about an axis transverse to said steering axis, manual steering means fixed to an upper portion of said fork assembly, a cambering main frame having a forward support mounting said steering fork assembly for pivotal movement about said steering axis, a rear carriage, forward and rearward pivots pivotally supporting said cambering main frame for left and right cambering movement with respect to said rear carriage about a centralized roll axis, a pair of laterally spaced road wheels operatively supporting said rear carriage, vehicle engine means for driving said rear wheels and rigidly secured to and extending forwardly from said rear carriage to form a forward portion thereof, said forward pivot supported by and extending forwardly of said engine means, said cambering frame having a forward portion pivotally mounted on said forward pivot, said cambering frame extending upwardly and rearwardly from said forward pivot over said engine and rear carriage into connection with said rearward pivot, a seat on said cambering main frame for supporting a vehicle operator and laterally spaced footrest means secured to said rear carriage for receiving the feet of said operator when seated on said seat to permit said operator to directly use said engine means and rear carriage as a ground and instinctively balance said main frame when cambered.

4,437,536

SUPPORT ASSEMBLY FOR VEHICLE WHEELS

Franco Colanzi, and Vittorio Donn, both of Turin, Italy, assignors to RIV-SKF Officine, Turin, Italy

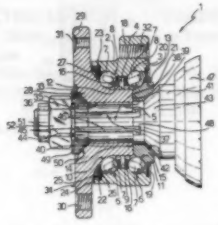
Filed Apr. 29, 1982, Ser. No. 372,962

Claims priority, application Italy, May 18, 1981, 67655 A/81

Int. Cl.³ B60B *37/00*; B60K *17/22*

U.S. Cl. 180—254 **15 Claims**

1. A support assembly (**1**) for a wheel of a vehicle, particularly for a driving wheel of a road vehicle, comprising at least one inner ring (**5**) provided with a flange (**29**) for fixing to the said wheel, an outer ring (**2**) provided with a fixing flange (**4**) for fixing to a wheel suspension strut, and a pair of rings (**6**) of rolling elements (**7**) interposed between said rings (**2,5**) and able to roll on tracks (**8,10,11**) on said rings (**2,5**), said inner ring (**5**) being rigidly mounted on a shaft (**38**) provided with a shoulder (**41**) for axially fixing said inner ring (**5**), wherein said inner ring (**5**) has at its opposite ends a first (**42**) and a second (**35**) conical surface respectively, these surfaces being coaxial and directed in opposite directions, said first conical surface (**42**) being engageable with a complementary third conical surface (**43**) formed on said shoulder (**41**) coaxially with re-



spect to a cylindrical surface (**44**) coaxial to said shaft (**38**) including at one end (**45**) of the said shaft (**38**), a centering ring (**49**) mounted coaxially with respect to said cylindrical surface (**44**) and being provided with a complementary fourth conical surface (**50**) engageable with said second conical surface (**35**), axial thrust means (**51**) for pressing against and holding said centering ring (**49**) in position on said shaft (**38**).

5. A support assembly (**1**) according to claim **1**, wherein said shaft (**38**) is integrally formed with a ball joint (**47**) operable to transmit a couple from a half-shaft of said vehicle to said shaft (**38**).

4,437,537

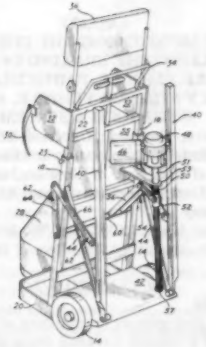
VEHICLE FOR SUPPORTING HANDICAPPED OCCUPANTS

Donald L. Ausmus, 14131 E. 39th Ter., Independence, Mo. 64055

Filed Jan. 25, 1982, Ser. No. 342,353

Int. Cl.³ B62D *61/06*; A61G *5/04*

U.S. Cl. 180—313 **16 Claims**



1. An occupant operated motor driven vehicle for supporting a handicapped occupant, such as, a paraplegic, comprising in combination:

(a) a vehicle comprising a frame supported on at least one front wheel and at least one rear wheel and including

structure for supporting a handicapped occupant in said vehicle;

(b) at least one support foot rotatably attached to said vehicle adapted to swing forwardly of said vehicle and contact the vehicle support surface for supporting said vehicle in a forward tilt when said foot is locked in stationary position;

(c) support foot positioning means connected between said foot and said frame operative to position said foot at various angles to said vehicle;

(d) occupant operated driving means for operating said support foot positioning means to position said foot at various angles to said vehicle, and

(e) means for locking said foot in a desired angular position to support said vehicle and occupant in a forward angular position.

4,437,538

EAR-CAP

Ingemar Ohlsson, Katarinavägen 18, Stockholm, Sweden S-116 45, and Sten J. L. Wolf, Dånviksvägen 1, Rönninge, Sweden S-144 00

Filed Mar. 30, 1982, Ser. No. 363,460
Int. Cl.³ A61F *11/02*; H04R *25/00*
U.S. Cl. 181—129 **9 Claims**

1. Ear protecting means for protecting the auditory canal of the ear from sound vibrations within a predetermined frequency range comprising:

an earcap including sound absorbing means for absorbing sound of said predetermined frequency and sound transmitting means for transmitting ambiant sount vibrations to said auditory canal and to said sound absorbing means,

a housing for said earcap having a recessed portion therewithin,

said sound absorbing means comprising a sound-damping cavity within said earcap for damping sound of said predetermined frequency, said cavity being defined by the recessed portion of said housing and a perforated disc element having perforations adapted for admitting sound of said predetermined frequency to said cavity for damping therewithin; and

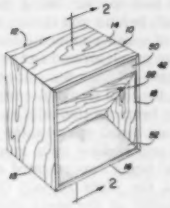
said sound transmitting means comprising an ear cushion of sound-transmitting material having an inner surface adapted to bear on the outer auditory canal of the ear and an outer surface disposed against the perforated portion of said perforated disc element so that sound vibrations entering the auditory canal must first pass through said cushion of sound transmitting material and so that sound vibrations of said predetermined frequency passing through said cushion also pass through said perforated disc element into said cavity for damping therewithin.

4,437,539

SPEAKER ENCLOSURE

Lawrence M. Festa, 238 Cajon St., Laguna Beach, Calif. 92651

Filed Sep. 30, 1982, Ser. No. 429,540
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—145 **7 Claims**



1. A speaker enclosure adapted for use with a speaker system including a bass speaker, a mid-range speaker, and a tweeter, said speaker enclosure comprising:

a housing having oppositely disposed side walls, top and bottom walls, a rear wall, and a front wall;

said front wall being formed having a plurality of sections, including at least an upper section and a lower section, which are angularly disposed relative to each other;

a bass-reflex port formed in said lower section;

a mid-range port formed in said upper section;

an intermediate partition positioned within said housing;

said intermediate partition defining a rear bass-reflex chamber in which said bass speaker is mounted, whereby low bass-frequency tones from said bass speaker are transmitted through said bass-reflex port which communicates with said bass-reflex chamber; and

a forward mid-range chamber, said mid-range speaker being mounted to said intermediate partition, whereby mid-range-frequency tones are transmitted into said mid-range chamber and through said communicating mid-range port;

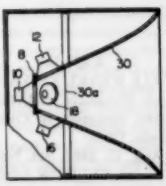
said tweeter being mounted to said front wall so as to emit high-frequency tones outwardly from said enclosure.

4,437,540

LOUD-SPEAKER

Naoyuki Murakami, and Hiroshi Zyo, both of Tokyo, Japan, assignors to Naoyuki Murakami, Tokyo, Japan

Division of Ser. No. 192,187, Sep. 30, 1980, Pat. No. 4,391,346. This application Mar. 7, 1983, Ser. No. 472,958
Claims priority, application Japan, Oct. 4, 1979, 54-127325; Aug. 30, 1980, 55-120187
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—147 **2 Claims**



1. A loudspeaker, comprising:

(a) a casing for accommodating therein speaker units, said casing being enclosed, except for an open front part, by four side walls and a back wall;

(b) a sounding horn provided in the open front part of said casing, said sounding horn having a throat opening lying

in a plane substantially parallel to said back side wall and being symmetrical about a line perpendicular to said back side wall;

(c) a plurality of speaker fitting panels mounted around and behind said throat at an angle to the plane of said throat diverging in the direction of said throat, the forward edges of said fitting panels defining a plane coincident with the plane of the throat opening, and a back fitting panel mounted on said speaker fitting panels, parallel to said back side wall, behind said throat; and

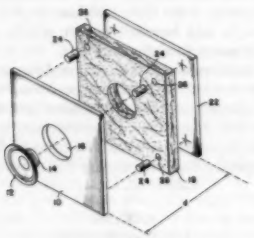
(d) a plurality of speaker units intensively mounted on said speaker fitting panels around and behind said throat opening, and a back speaker unit mounted on the said back fitting panel, the total area of the entire diaphragms of said speaker units being substantially equal to, or larger than, the area of said throat opening, the sound wave radiating direction of said speaker units mounted on said speaker fitting panels' being concentrated on a single imaginary point behind the plane of said throat opening, hence within the ambit of the space defined by said speaker fitting panels and on the said line perpendicular to the back about which the said throat opening is symmetrical, and the sound wave radiation direction of said back speaker unit being along said line.

4,437,541

CONTROLLED DISPERSION SPEAKER CONFIGURATION

Skip D. L. Cross, P.O. Box 2410, Alexandria, Va.

Filed Apr. 29, 1982, Ser. No. 373,101
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—151 **6 Claims**



1. A speaker comprising:

an enclosure formed by first and second parallel, spaced-apart, planar baffles, said enclosure being acoustically open on at least two sides;

first speaker means mounted to said first baffle;

acoustically absorptive material secured between said first and second baffles; and

the spacing between said first and second spaced-apart baffles is less than one-fourth of the wavelength of the highest frequency to be reproduced by said speaker system.

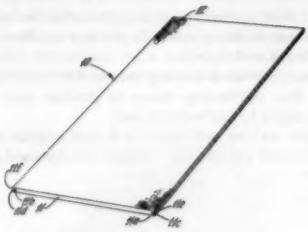
4,437,542

ACOUSTICAL WALL PANEL AND MOUNTING SYSTEM

Raymond W. Yeager, Pataskala, and Mark R. Weitzman, Toledo, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 23, 1982, Ser. No. 410,797
Int. Cl.³ E04B *1/82*
U.S. Cl. 181—290 **19 Claims**

1. An acoustical treatment for a wall comprising an elongated generally H-shaped spline mounted on the wall in parallel relationship thereto and a pair of elongated generally rectangular sound absorbent panels mounted on the wall in cooperative engagement with said spline respectively on opposite sides thereof and in abutting relationship with each other at front longitudinal edge portions thereof, the longitudinal edge portions of said panels being provided with kerfs for respectively receiving portions of said spline, each of said panels having a fabric adhered to a front face thereof and cut flush with the longitudinal edge portions thereof but nevertheless concealing the joint between the abutting front longitudinal



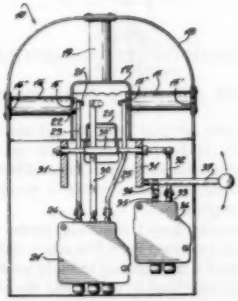
edge portions, the fabric being formed of non-woven staple fibers needle-punched in a first needle-punching operation, the fabric having linear ribs formed in another needle-punching operation, and the ribs extending longitudinally of the mounted panels.

4,437,543

CONTROL SYSTEM FOR CAGE SUPPORTED BY ARTICULATED BOOM

Paul Fortin, Loretteville; Paul Michaud, Ancienne-Lorette, and Martin Pernicka, Loretteville, all of Canada, assignors to Poudrier Frere Ltee, Quebec, Canada

Filed Aug. 10, 1981, Ser. No. 291,516
Int. Cl.³ B66F *11/04*
U.S. Cl. 182—2 **9 Claims**



1. A control system for a personnel carrier attached to a boom which is displaceable by pressure fluid, said control system comprising three hand operable control handles axially rotatable in a limited clockwise or counter-clockwise direction to cause said boom to be elevated or lowered respectively, a control valve associated with each of said control valve associated with each of said control handles and having at least one adjustable pressure fluid control component therein to control the displacement of said boom, a movable linkage secured at one end to each of said control handles and at an opposed end to said fluid control component whereby rotation of said control handles causes displacement of said control component to regulate said pressure fluid which in turn controls the displacement of said boom, said boom being a two-section articulated boom, two of said handles being horizontally mounted for an operator's right and left hand, each of said two handles controlling the displacement of a respective one of said boom sections, and a third of said control handles being vertically

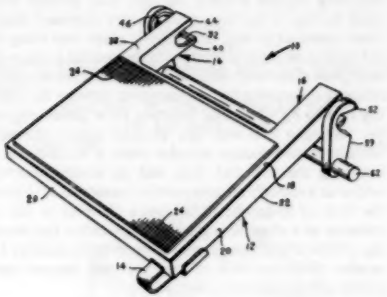
mounted and controlling the rotational displacement of a turret base onto which said boom is secured whereby to displace said boom along an arc of a circle.

4,437,544

SERVICE PLATFORM FOR A LADDER

Harold R. Anderson, Winchester, and Roland M. Hamilton, Groton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 22, 1983, Ser. No. 468,628
Int. Cl.³ E06C 7/16, 7/14
U.S. Cl. 182—120 **9 Claims**



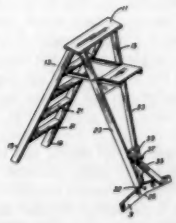
1. A service platform for a ladder comprising:
a frame upon which a user stands;
a pair of extended arms fixedly attached to said frame, said extended arms having rung slots therein for receiving a ladder rung;
a bearing attached to each of said extended arms, said bearing having a slot therein for receiving said ladder rung;
a support lever attached to each of said bearings, said support levers having a rung slot therein for receiving said ladder rung and bore means therethrough; and
a support bar attached to said support levers through said bores means.

4,437,545

STEP LADDER

Ernest Pardee, Newport, N.Y., assignor to Charles Mankouski, Middleville, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,983
Int. Cl.³ E06C 7/44
U.S. Cl. 182—171 **2 Claims**



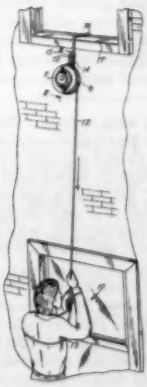
1. A step ladder for use on an uneven surface, comprising:
a top platform including a generally rectangularly-shaped member with an underside surface;
a step frame including two step side members and a plurality of cross members located between the two side members and being rigidly affixed thereto, each cross member being located substantially parallel to one another and to the top platform, both side members being pivotably connected to the underside surface of said top platform;
a support frame including two support side members joined together at one end in a V-shaped configuration with an apex at one end and two separated members at the other end, the two separated members being pivotably mounted to the underside of said top platform, said support frame further including a V-shaped block rigidly mounted between the two support side members at the apex;
a leveling bar including an elongated member with an arcuate shape, said leveling bar being pivotably mounted at its center point on the apex of the support frame with the ends of the leveling bar extending beyond the apex;
a raised platform rigidly mounted on the outside of the two support members above the V-shaped block;
an adjustment bar including an elogated bar with a slot along its centerline located toward one end of the adjustment bar said adjustment bar being pivotably mounted at its other end on the leveling bar approximately midway between the one end of said leveling bar and the center point of the leveling bar;
a bolt means rigidly mounted in said raised platform and slidably mounted in the slot of the adjustment bar; and
a nut means threadably engaging said bolt means for securing said adjustment bar in a fixed position.

4,437,546

FIRE ESCAPE DEVICE

Gerald P. Marinoff, 8 Rockford Dr., West Nyack, N.Y. 10994, and W. Dorwin Teague, Nyack, N.Y., assignors to Gerald P. Marinoff, West Nyack, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,882
Int. Cl.³ A62B 1/12
U.S. Cl. 182—233 **9 Claims**



1. A fire escape device comprising a housing, a reel journalled for rotational movement within said housing, a cable fixed at one end thereof to said reel being wound upon said reel with the other end thereof extending through an opening in said housing, means carried by said housing for connecting said device to a fixed position on an elevated structure, harness means carried at the free end of said cable for supporting a human body, a sump reservoir within said housing, positive displacement fluid pump means carried by said housing for pumping fluid from said sump reservoir through an orifice, said pump means having a rotor, means coupling the rotor of said pump with said reel for retarding and impeding free rotational movement of said reel and at a controlled rate of speed in direct proportion to the amount of fluid being pumped through said orifice, said means coupling the rotor of said pump with said reel comprises a ring gear carried by said reel for rotation therewith, a shaft journalled for rotation within said housing

and coupled with the rotor of said pump for driving said rotor when said shaft is rotated in a first direction, and a planetary gear system coupled between said ring gear and said shaft for causing rotation of said shaft in said first direction when said reel is rotated in a direction for unwinding of said cable, free wheeling bearing means journalling said shaft so that when said shaft is rotated in a second direction opposite to said first direction, said rotor will not be driven, and a cover plate mounted over the exit port of said pump, said orifice being formed in said cover plate, and wherein said orifice is dimensioned so as to control the rate of flow of fluid therethrough and thereby the rate or retardation of said reel, whereby the rate of retardation of said reel is independent of the viscosity of said fluid.

4,437,547

FRICTION LINING WEAR INDICATORS FOR SHOE-DRUM BRAKES

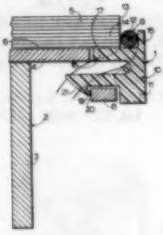
George A. Harmer, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Division of Ser. No. 116,668, Jan. 29, 1980, Pat. No. 4,344,509. This application Apr. 29, 1982, Ser. No. 373,276

Claims priority, application United Kingdom, Feb. 15, 1979, 7905321

Int. Cl.³ F16D *66/02*

U.S. Cl. 188—1.11 **12 Claims**



1. A friction lining wear indicator for a brake shoe of a shoe-drum brake, said brake shoe including a platform and a friction lining carried by said platform for engagement with a rotatable drum, said platform having axial edges and a depression formed in one of said axial edges by displacement of a portion of said one edge in a radial direction away from said friction lining, said friction lining having a first face for engagement with said platform and a second face for engagement with said drum, a portion of said first face of said friction lining in the region of said displaced portion of said edge being unmodified, said friction lining wear indicator comprising a sensor mounted on said brake shoe, an indicating means adapted to be actuated when the thickness of said friction lining is less than a predetermined value, mounting means for mounting said sensor on said shoe, said mounting means being located in said depression, and retaining means associated with said mounting means for co-operating with said shoe to retain said sensor in a position of use adjacent said lining.

4,437,548

SHOCK ABSORBER

Masahiro Ashiba, Kanagawa, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 240,791, Mar. 5, 1981, abandoned. This application Jun. 16, 1983, Ser. No. 503,650

Claims priority, application Japan, Mar. 12, 1980, 55-32192[U]

Int. Cl.³ F16F *9/342*

U.S. Cl. 188—289 **21 Claims**

1. A shock absorber, comprising:

a hollow outer cylinder having an open and a closed end;

a hollow inner cylinder having an open and a closed end, the open end thereof being inserted into the open end of the outer cylinder;

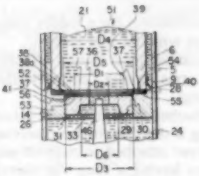
a guide member for guiding the inner cylinder slidably in the outer cylinder in the axial direction of the cylinders;

a first annular plate having a first annular surface and an opposing second annular surface, said first annular plate being abutted against the open end of said inner cylinder at the first surface thereof;

a shearable stop plate in the form of an annulus, said stop plate having a first annular surface and an opposing second annular surface, and being abutted against an inner periphery of the second surface of the first annular plate at an outer periphery of the first surface thereof;

a second annular plate having a first annular surface and an opposing second annular surface, said second annular plate having a slightly smaller outer diameter than the inner diameter of said first annular plate, and being abutted against an inner periphery of the second surface of the stop plate at an outer periphery of the first surface thereof;

a cylindrical damping force generating member for generating a damping force, said damping force generating member having a first end face abutted against the second surface of said second annular plate, a second end face opposing the first end face, and an axially penetrating orifice at a radially central portion thereof so as to throttle the flow of hydraulic fluid from a chamber in the outer cylinder to a chamber in the inner cylinder, the penetrating orifice of the damping force generating member being smaller than apertures of said first and second annular plates and of said stop plate; and



a tubular supporting member fixed to the inner cylinder near the open end thereof, said supporting member presenting an axial bore penetrating said supporting member and adapted for receiving said damping force generating member and said second annular plate therewithin, such that said damping force generating member and said second annular plate may be axially guided toward said stop plate, and said supporting member having an annular end face at its inner periphery abutted against the outer periphery of the second surface of said stop plate so as to hold an outer periphery of said stop plate in cooperation with said first annular plate, such that the stop plate is adapted in such a manner that, when an impact shock given to the shock absorber to contract it is not greater than a predetermined magnitude, the stop plate retains the damping force generating member in the axial bore of the supporting member at the inner periphery of the second surface of said stop plate against a force not greater than a predetermined magnitude axially exerted to the damping force generating member in response to the shock, and that, when an impact shock given to the shock absorber to contract it is greater than the predetermined magnitude, the stop plate is sheared off in a generally circular shape at a portion between the held outer periphery which is supported by said first annular plate at the first face of the stop plate and an inner periphery by a force greater than the predetermined magnitude axially exerted on the inner periphery of the second surface of said stop plate from the damping force generating member through said second annular plate in response to the shock, such that the damping force generating member is detached from the axial bore of the

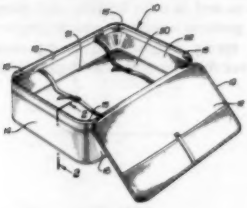
supporting member and moved into the inner cylinder permitting the hydraulic fluid in the chamber of the outer cylinder to flow substantially freely into the chamber of the inner cylinder through the penetrating bore of the supporting member.

4,437,549

SUITCASE

Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049

Filed Mar. 10, 1980, Ser. No. 128,635
Int. Cl.³ A45C 7/00
U.S. Cl. 190—109 **1 Claim**



1. A suitcase for supporting and carrying personal belongings comprising:

(a) coextensive spaced-apart first and second panel means;

(b) means circumscribing said first and second panel means to define an interior region;

(c) a generally firm pad means disposed within said interior region between the spaced-apart first and second panel means;

(d) a textile non-elastic skirt having an interior border joined to the border of the pad means and an exterior border fastened to the interior wall of said means circumscribing the panel means at a location closer to said first panel means than to said second panel means, said pad means and skirt dividing said interior region into first and second compartments, said skirt having a width between its interior and exterior borders greater than the normal distance from the border of said pad means to said interior wall such that when said first panel means is uppermost, said pad means is suspended by said skirt in a first position approximately midway between said first and second panel means so that said first and second compartments have comparable volumes, said pad means being movable upwardly from said first position to a second position against said first panel means to be substantially flush therewith thus providing said second compartment with almost the entire volume of both compartments; and

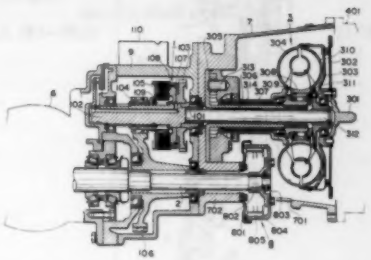
(e) means for providing access to each compartment, whereby when said pad means is in said first position, clothing and articles can be packed in said first compartment and held by said pad means and skirt in the upper half of said interior region whether or not said second compartment is empty or full, and whereby when said pad means is in said second position, identical although smaller suitcases can be received in said second compartment in nesting relationship.

4,437,550

INDUSTRIAL VEHICLE DRIVING APPARATUS

Koji Nozawa, Higashikurume, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 27, 1981, Ser. No. 296,820
Claims priority, application Japan, Sep. 12, 1980, 55-126809
Int. Cl.³ B60K 41/24, 41/28
U.S. Cl. 192—324 **4 Claims**



1. A driving apparatus for an industrial vehicle comprising:

(a) a torque converter;

(b) a transmission;

(c) a torque converter housing for protecting said torque converter, said torque converter housing defining a space therein;

(d) a transmission housing for protecting said transmission, said transmission housing being connected in series with said torque converter housing;

(e) an output shaft of said transmission, one end of said output shaft being disposed within the space defined by said torque converter housing; and

(f) a center brake device for applying a braking force to said output shaft, said center brake device being disposed at the end of said output shaft housed within the space defined by said torque converter housing.

4,437,551

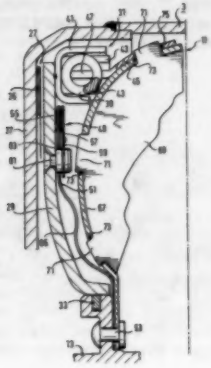
HYDRODYNAMIC TORQUE CONVERTER

Joachim Gimmler, Dittelbrunn, and Bernd Schöder, Münnerstadt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 23, 1981, Ser. No. 285,985
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029860
Int. Cl.³ F16H 45/02
U.S. Cl. 192—3.28 **6 Claims**

1. Hydrodynamic torque converter comprising a converter housing, a pump wheel, a turbine wheel and a guide wheel located within said housing, said pump wheel, turbine wheel and guide wheel interact in a fluid cycle and are rotatable relative to one another, said pump wheel and said turbine wheel have a torque transmission path between them, a controllable bridging clutch arranged between said pump wheel and said turbine wheel and disposed in parallel relation to the torque transmission path therebetween, a torsional vibration spring damper located in the torque transmission path of said bridging clutch, wherein the improvement comprises a friction damper connected in parallel to said torsional vibration spring damper, said pump wheel is fixed to said converter housing, said converter housing having an end face forming a clutch countersurface, said bridging clutch includes a clutch disc coaxial with and axially slidable relative to said turbine wheel, said clutch disc is rotatable over a limited angle of rotation relative to said turbine wheel, said clutch disc is positioned between said turbine wheel and said end face of said converter housing, said torsional vibration spring damper includes several springs distributed over the periphery of said clutch disc, stops on said turbine wheel and on said clutch disc projecting

toward one another, said springs positioned between said stops, said friction damper includes an axially elastic disc having a radially inner region fixed to said turbine wheel, said



radially outer region having friction facings thereon, and said axially elastic disc prestresses said clutch disc and is torsion-resistant in the circumferential direction.

4,437,552

SPRING CLUTCH DEVICE

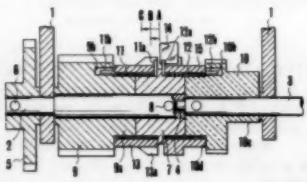
Masamichi Toyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Oct. 16, 1981, Ser. No. 312,321

Claims priority, application Japan, Oct. 24, 1980, 55-149657; Dec. 17, 1980, 55-178604

Int. Cl.³ F16D *21/04, 13/08;* G03B *3/10*

U.S. Cl. 192—26 **2 Claims**



1. A spring clutch device comprising:

a driving shaft connected to a drive source and arranged to be rotatable;

a first driven member rotatably supported around said driving shaft;

a second driven member supported to be concentrically rotatable on the extension of said driving shaft;

a first wrapped spring wound into a coil like shape around the outer circumference of said driving shaft, said spring having one end thereof connected to said first driven member and being arranged to transmit the rotation of said driving shaft to said first driven member, said spring being provided with a projection formed at the other end thereof;

a second wrapped spring wound into a coil like shape around the outer circumference of said driving shaft, said spring having one end thereof connected to said second driven member and being arranged to transmit the rotation of said driving shaft to said second driven member, said spring being provided with a projection formed at the other end thereof;

said first and second wrapped springs being wound in directions opposite to each other and being spaced at a predetermined distance with their projections arranged close to each other;

a change-over member capable of entering into and retracting from the turning paths of said two springs, said change-over member being shiftable between a position in which it engages said projection of said first spring, a position in which it engages said projection of said second spring and another position in which it engages said projections of both springs, said change-over member being arranged to cut off transmission of rotation of said driving shaft to said driven members when the change-over member is in each of said engaging positions;

a ring member connected to said projection of said first spring, said ring member being provided with a plurality of engaging parts for engagement with said change-over member, said engaging parts being arranged on the outer circumference of said ring member;

spring means for urging said change-over member in the direction of engaging said second wrapped spring; and

a retaining ring which is arranged to be coupled with said projection of said second wrapped spring to rotate together with said spring, said ring being provided with a slit which is arranged to engage said change-over member and with an end face for keeping said change-over member in a position engaging said projection of said first wrapped spring against said spring means until said change-over member comes to engage said slit.

4,437,553

FREEWHEELING CLUTCH ASSEMBLY

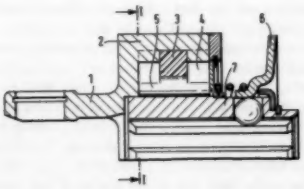
Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,792

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047891

Int. Cl.³ F16D *41/06, 41/12*

U.S. Cl. 192—46 **14 Claims**



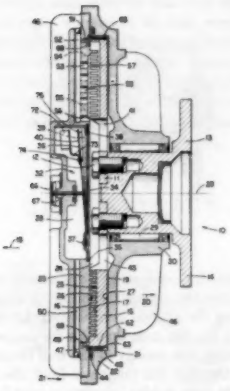
1. A freewheeling clutch assembly comprising a driving member, a driven member, clutch engaging means operatively interposed between said driving and driven members to effect driving engagement therebetween and to disengage said members for free-wheeling operation when said driven member overruns said driving member, and re-engagement means for urging said clutch engagement means into driving engagement between said driving and driven members, said clutch engagement means comprising pawl means pivotally mounted on one of said driving and driven members and ratchet means on the other of said members adapted to be engaged and disengaged by said pawl means, said re-engagement means comprising resilient means affixed to said other of said driving and driven members for pivoting said pawl means into driving engagement with said ratchet means when said driving member commences to overrun said driven member.

4,437,554

FLUID SHEAR COUPLING APPARATUS

Paul J. Haeck, Indianapolis, Ind., assignor to Household Manufacturing Inc., Prospect Heights, Ill.

Filed Jun. 19, 1981, Ser. No. 275,211
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ F16D 35/00, 43/25
U.S. Cl. 192—58 B 19 Claims



1. A fluid shear coupling apparatus which comprises:

a driving member including a disc-shaped portion having a front side and a rear side, the front side including a first shear surface;

a driven member defining a working chamber within which said driving member is received, said driven member including a first shear surface configured and positioned complementary to the first shear surface of said driving member to define a fluid shear chamber therebetween and cooperable with shear fluid in the fluid shear chamber to transmit torque between said driving member and said driven member;

mounting means for mounting said driven member to said driving member and rotatable about a common axis;

a shear fluid reservoir;

first flow means for providing flow of shear fluid between said reservoir and the working chamber;

second flow means, separate from the working chamber and said reservoir, for providing flow of shear fluid from a first, radially-outward location of the working chamber directly to a second, radially-inward location of the working chamber when shear fluid is contained within the working chamber, the second, radially-inward location being radially within the fluid shear chamber; and

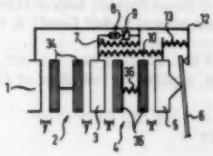
control means for providing at least a first condition during which shear fluid moves through said first flow means from said reservoir to the working chamber to cause coupling of said driving member and driven member and a second condition limiting shear fluid in the working chamber to cause reduced coupling.

4,437,555

MULTIPLE DISK CLUTCH WITH SPRING CONTROL LIFT

Dagwin Tomm, Schweinfurt, and Erich Scheer, Escherndorf, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,741
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041341
Int. Cl.³ F16D 13/56, 13/75
U.S. Cl. 192—70.21 11 Claims



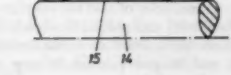
1. Multiple disk clutch, such as a double disk clutch, includes a housing, a flywheel acting as a counter-pressure plate, an intermediate plate spaced from said flywheel, a first clutch disk positioned between said flywheel and intermediate plate, a spring-loaded pressure plate spaced from said intermediate plate on the opposite side thereof from said first clutch disk, a second clutch disk positioned between said intermediate plate and said pressure plate, said first and second clutch disks arranged to be mounted on a shaft so that said disks rotate with the shaft and are axially movable relative to the shaft, spring means connected to said intermediate plate for lifting said intermediate plate, said spring means including a lifting distance limitation device and an automatic readjustment device functioning in accordance with the wear on said first clutch disk, wherein the improvement comprises that said spring means includes a spring member acting on said intermediate plate in the direction of the engagement of the clutch while the clutch is being engaged, a lifting spring for lifting said intermediate plate, said lifting distance limitation device and readjustment device located one behind the other and disposed in parallel with said lifting spring, and said spring member having at least one spring disposed parallel to said lifting spring and connected to said pressure plate.

4,437,556

THROW-OUT BEARING FOR CLUTCHES, ESPECIALLY FOR MOTOR VEHICLES

Manfred Brandenstein, Eussenheim, and Leo Müller, Essleben, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,337
Claims priority, application Fed. Rep. of Germany, May 24, 1980, 8014056
Int. Cl.³ F16D 23/14
U.S. Cl. 192—98 15 Claims



1. In a throw-out bearing for clutches comprised of a guide element held to a clutch or drive housing, a movable part having a bore within which the guide element extends, the

bore having a diameter greater than that of the guide element, the movable part being supported on the guide element by flexible means, the improvement wherein said flexible means comprises conical annular projection means extending from at least one end of said movable part radially inwardly to the guide element for supporting said movable part on the guide element, said projection means being shaped to wipe said guide element on relative axial movement between the movable part and guide element.

4,437,557

COIN COLLECTION FOR VENDING MACHINES

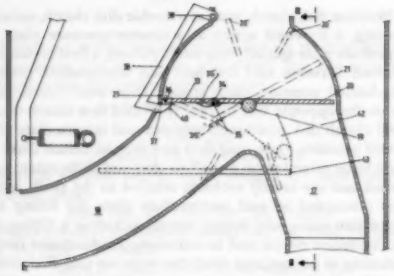
Richard Kölbl, and Bernd Mehlan, both of Herrieden, Fed. Rep. of Germany, assignors to Sielaff GmbH & Co., Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,294

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037996

Int. Cl.³ G07F 9/00

U.S. Cl. 194—1 D 10 Claims



1. A coin collector for a vending machine having a credit indicator with a reset member movable to reset the credit indicator and a coin return bolt movable through a full stroke, comprising:

means defining a coin return channel having an inlet for receiving at least one coin;

a swivel plate pivotally mounted over said inlet having a rest position obstructing a passage of the coins to said return channel and a coin release position for opening said inlet;

means connecting said swivel plate to the return bolt for transmitting motion of the return bolt to said swivel plate;

means connecting said swivel plate to the reset member for moving the reset member with movement of said swivel plate out of its rest position;

position control means associated with said swivel plate for obstructing said inlet during a first portion of the full stroke of movement of the return bolt as said swivel plate is moved out of its rest position to move the reset member to reset the credit indicator and for orienting said swivel plate into its coin release position with movement of the return bolt through a remaining portion of its full stroke;

said means defining a coin return channel comprising a wall defining an arcuate upper space above said swivel plate, said swivel plate connected to a shaft rotatably mounted to said wall, said swivel plate having opposite edges each movable adjacent and along said wall in said arcuate space;

said swivel plate including a hinged portion rotatably mounted to a remainder of said swivel plate over said coin return channel inlet and spaced from said shaft, a support element connected to a bottom surface of said swivel plate to support said hinged portion, a stop lever rotatably mounted to said wall having a stop surface engaged with said hinged portion during said first portion of the full stroke of the bolt and released from said stop face during said remainder of the full stroke, said stop lever having a lower inclined surface engageable by said hinged portion during movement of said swivel plate from its coin release position back to its rest position.

4,437,558

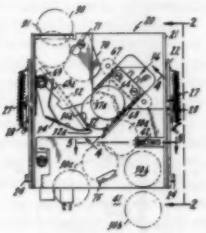
COIN DETECTOR APPARATUS

Raymond Nicholson, 817 Industrial Dr., Elmhurst, Ill. 60126, and Donald O. Parker, 1331 Phillips St., SW., Grand Rapids, Mich. 49507

Continuation-in-part of Ser. No. 387,820, Jun. 14, 1982. This application Jun. 8, 1983, Ser. No. 502,290

Int. Cl.³ G07F 3/02

U.S. Cl. 194—97 R 7 Claims



1. In a coin tester for comparing a test coin to a sample coin, including coil assembly means for creating a magnetic field, means for locating the sample coin within the magnetic field, means for passing the test coin through the magnetic field, and means for evaluating the quality of the null created by the test coin as it passes through the magnetic field, the improvement comprising, single coin nolder locating means for establishing a position for a portion of the periphery of the sample coin, means associated with the locating means and the coil assembly for relatively moving the holder and coil assembly to insert a sample coin and hold the sample coin in a predetermined position, the sample holder means having a ramp surface for guiding the test coin through the magnetic field, the angle of the ramp surface being the same as for the sample coin, thereby to cause the test coin to enter the magnetic field to the same extent as the sample coin.

4,437,559

METHOD AND APPARATUS FOR REMOVING NON-RECTIFIED CAPSULES FROM A CAPSULE RECTIFICATION AND TRANSPORT DEVICE

Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Filed Sep. 1, 1978, Ser. No. 939,066

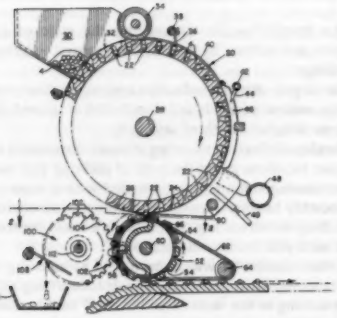
Int. Cl.³ B65G 47/24

U.S. Cl. 198—397 22 Claims

1. In a capsule rectification apparatus adapted to rectify capsules having body portions and having cap portions which are of greater diameter than said body portions, and wherein an introduction means is provided from which a multiplicity of capsules may be introduced into said rectification apparatus, and wherein a rectification means is disposed for rectifying said capsules in dispositions in which the said cap portions, are oriented toward one side of a predetermined path and in which said body portions are oriented toward another side of the predetermined path as said capsules are moved along said predetermined path and wherein occasional capsules are sometimes improperly positioned in a non-rectified manner with their cap and body positions reversed, the combination which comprises:

(a) means positioned adjacent said predetermined path for contacting said improperly positioned capsules as they are carried along said predetermined path; said means (a)

comprising pick-off means located adjacent said predetermined path and engagement means for grasping said improperly positioned capsules, said engagement means being shaped in such manner so as to grasp only improperly positioned capsules while not being capable of grasping properly positioned capsules and said engagement means comprises cap portions grasping means carried by said pick-off means for grasping cap portions of non-rectified capsules, wherein said cap portion grasping means comprises a plurality of cut-out grasping elements spaced apart from each other around the periphery of said pick off means, said grasping elements being shaped and dimensioned to firmly grasp a cap portion therein, but being dimensioned such as to be incapable of grasping a body portion therein, and wherein said pick-off means is positioned alongside a portion of said predetermined path where the body portions of properly rectified capsules are to be located, whereby said cap portions grasping means is adapted to grasp any non-rectified capsule having its cap portion disposed into the same direction as the body portions of said properly rectified capsules and



(b) means for removing said improperly positioned capsules from said path, said removing means including a stripping means for stripping capsules from said engagement means.

11. A method for transporting and rectifying capsules of the type having body portions and having cap portions of greater transverse dimension than said body portions, wherein said capsules are arranged in a plurality of adjacent rows which extend in a transport direction and wherein said capsules are rectified in dispositions in which the cap portions of a row of capsules face a predetermined direction and in which the body portions of said capsules face in substantially opposite direction, and wherein capsules are sometimes improperly positioned in non-rectified manner with their cap and body portions reversed,

the steps which comprise providing a capsule engagement means, shaping said capsule engagement means in such manner so as to grasp only non-rectified capsules while being incapable of grasping said properly rectified capsules, grasping said non-rectified capsules with said engagement means and the grasped non-rectified capsules from the array while allowing the properly rectified capsules to continue in said array.

4,437,560

APPARATUS FOR CHANGING THE DIRECTION OF TRANSPORT OF PAPER STACKS OR THE LIKE

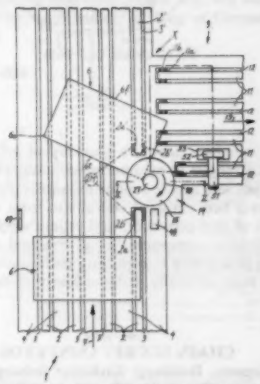
Wolfram Wolf, Bilsen, Fed. Rep. of Germany, assignor to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,282

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111445

Int. Cl.³ B65G 47/26

U.S. Cl. 198—457 25 Claims



1. Apparatus for changing the direction of transport of at least some of a series of successive commodities, comprising a first conveyor arranged to advance the commodities of said series along a first path; a second conveyor arranged to advance commodities along a second path which is at least substantially coplanar with and is inclined with reference to said first path; and means for transferring commodities from said first path into said second path, including openable and closable tongs rotatable about an axis which is adjacent to and inclined relative to said paths, said tongs extending into portions of said first and second paths, means for rotating said tongs about said axis, and operating means for opening and closing said tongs so that a commodity advancing along said first path can enter said tongs before the tongs closes to transfer the thus engaged commodity into said second path as a result of rotation about said axis, said tongs comprising a first jaw and a second jaw disposed at a level above said first jaw, said first jaw having a surface arranged to engage a commodity to be transferred and coplanar with said paths and said operating means comprising means for moving said second jaw relative to said first jaw, said rotating means comprising a rotary shaft whose axis coincides with said axis and which is connected with said second jaw, said first jaw having an axial passage with an outline complementary to the cross-section of and axially movably receiving said shaft, said shaft and said first jaw having means for transmitting torque from said shaft to said first jaw and vice versa in each axial position of said shaft.

4,437,561

AUTOMATIC CONTINUOUS WEIGHING MACHINE

Eiichi Hasegawa, Kobe, and Shoji Yamano, Akashi, both of Japan, assignors to Yamato Scale Company, Ltd., Hyogo, Japan

Filed Feb. 24, 1982, Ser. No. 351,864

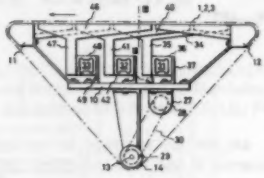
Claims priority, application Japan, Mar. 3, 1981, 56-30891

Int. Cl.³ G01G 11/00

U.S. Cl. 198—504 3 Claims

1. An automatic continuous weighing machine, comprising a plurality of endless conveyers driven at the same speed, and a plurality of weighing units, each weighing unit operatively

coupled to one of said conveyers, respectively, for sensing weights of articles carried on said conveyers, each of said conveyers including a plurality of endless circulating members arranged in parallel, characterized in that said endless circulating members of the respective conveyers are arranged in mutually parallel intervening fashion, whereby said conveyers each have a common article transporting path, each of said endless



circulating members having a plurality of article supporting subsections arranged at predetermined intervals in the lengthwise direction, said article supporting subsections belonging to each conveyer being aligned laterally to form article supporting sections of said conveyer, said article supporting sections of the respective conveyers being arranged sequentially in series along said article transporting path to allow themselves to move at least vertically, independently of each other.

4,437,562

CHAIN BUCKET CONVEYOR

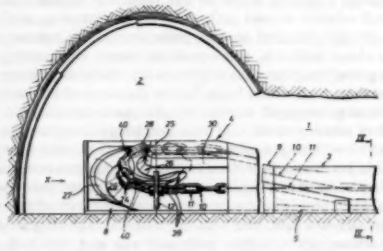
Manfred Koppers, Duisburg; Karlheinz Bohnes, Bochum, and Heinz Kunzer, Herne, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,716

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3043431

Int. Cl.³ B65G *19/08*

U.S. Cl. 198—733 **17 Claims**



1. A central chain flight conveyor for an underground excavation, comprising a substantially U-shaped forward conveyor part at the side of a sole and open toward a roof; a return conveyor part at the side of backfilling and closed in a substantially channel-like manner, said return conveyor part being normal to said forward conveyor part; an endless chain movable in said conveyor parts and including a flight chain member and a plurality of flights mounted thereon so that said chain member extends centrally of said flights and said flights move in one of said conveyor parts in a substantially horizontal position and in the other of said conveyor parts in a substantially vertical position; means for transporting said chain from one to the other of said conveyor parts with turning of said flights from one to the other of said positions and including actuating stations, a rotary chain wheel having chain pockets and arranged at said actuating stations rotatable about an inclined axis which ascends toward the roof and backfilling and is located in a vertical plane transverse to the longitudinal direction of the conveyor, and a conical surface narrowing toward the roof and having an axis coinciding with the axis of rotation of said chain wheel.

4,437,563

INSTALLATION FOR MONITORING AN ENDLESS CLOTH CONVEYOR BELT

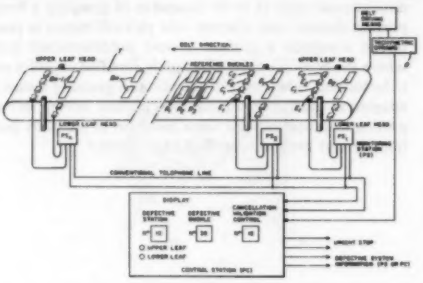
Marcel Oriol, 85 Bd Jean Jaures, 92100 Boulogne, France

Filed Jul. 30, 1981, Ser. No. 288,328

Claims priority, application France, Jul. 30, 1980, 80 16836

Int. Cl.³ B65G *15/00*

U.S. Cl. 198—810 **5 Claims**



1. An installation for monitoring the state of an endless conveyor belt driven by belt driving means, said installation comprising:

a plurality of closed conductive control buckles transversely disposed on said belt and distributed at spaced-apart locations along the path of said belt;

a plurality of fixed monitoring stations distributed at spaced-apart locations along the path of said belt and each of said monitoring stations being coupled with at least a detector assembly having at least a transmitter and a corresponding pick-up for detecting the passsage of said control buckles at each said monitoring station;

a central station to which each said monitoring station is connected for transmitting signals comprising information pertaining to the state of said control buckles and pertaining to the state of each said monitoring station, said central station comprising:

a central unit for receiving said signals;

programmed counters for counting the total numbers of impulses received between pairs of successive signals corresponding to successive control buckles and received by said central unit from each of said monitoring stations, and for comparing said total numbers to reference total numbers so as to deliver, in case of any discrepancy, signals corresponding to defective control buckles;

belt stop control means connected with said said central unit and for ordering said conveyor belt to stop when said central unit has received signals corresponding to defective buckles or monitoring stations;

display means connected with said central unit and for indicating the state of said control buckles and monitoring stations;

manual control means for inhibiting, when actuated, at least a signal corresponding to a defective control buckle or monitoring station;

automatic means for authorizing the continuation of the operation of said belt when said central unit receives signals corresponding to defective control buckles or monitoring stations after inhibition of said signals by said manual control means;

and wherein:

said control buckles are arranged in spaced apart pairs of

control buckles, with the control buckles of each pair are being mounted cross-wise on said belt;

each said detector assembly having a pair of transmitter and pick-up couples, each said transmitter and pick-up couple being arranged on the path of one control buckles of each said pair of control buckles, so as to generate a detection signal when an uncut control buckle passes opposite one of said pair of transmitter and pick-up couples;

said installation further comprising a plurality of pairs of closed conductive reference buckles, which are mounted at close spaced-apart locations lengthwise on a portion of said belt and the buckles of each said pair of reference buckles being mounted cross-wise on said belt portion, for giving a reference number to each said monitoring station and to each pair of said control buckles passing successively opposite each said detector assembly coupled to each monitoring station;

each said monitoring station comprising a buffer memory for storing information on the state of the buckles of a detected pair of control buckles, and a coding circuit for generating said coded detection signals, in coded form, each of said coded detection signals comprising said reference number of the corresponding monitoring station and said information on the state of the corresponding detected pair of control buckles;

all monitoring stations being connected to said central station by a single common conventional telephone line;

said central unit of said central station comprising a programmable memory emitting at regular intervals coded scanning signals for scanning successively, through said telephone line, said monitoring stations and receiving successively in response, through said telephone line, said coded detection signals from said monitoring stations, the buffer memory of each of which is emptied in response to the first coded scanning signal received after storage of information corresponding to the state of a detected pair of control buckles;

said central station further comprising a central control block connected to said central unit and comprising an active memory for storing, at the starting of said installation, information relating to said reference numbers of said pairs of control buckles and said monitoring stations and information relating to said reference total numbers which correspond to the total numbers of coded scanning signals transmitted to each of said monitoring stations between two successive coded detection signals corresponding to two successive pairs of control buckles and received by said central unit from the corresponding monitoring station;

said informations corresponding to said reference numbers and stored in said active memory being compared in said central station to said informations comprised in said coded detection signals received by said central unit so that said display means, which is common to all said pairs of control buckles and to all said monitoring stations, indicates in succession the reference numbers and states of said pairs of control buckles and in succession the reference numbers and states of said monitoring stations;

said information corresponding to said reference total numbers and stored in said active memory being compared to said total numbers of impulses, each of which corresponding to a coded scanning signal, and which are counted in said counters between the reception of two successive coded detection signals corresponding to two successive detected pairs of control buckles, so that said display means indicates, in case of any discrepancy, the number of the monitoring station that has not detected any passage of a pair of control buckles, the two buckles of which being defective; and

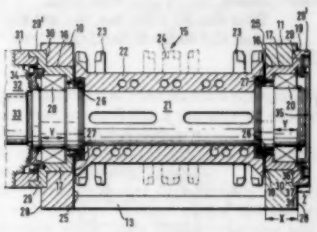
said central control block is connected to said manual control means for inhibiting any comparison of information comprised in a coded detection signal and corresponding to a reference number of a pair of control buckles or of a monitoring station the state of which has been displayed as defective, when said manual control means are actuated.

4,437,564

CONVEYOR DRIVE FRAME

Manfred Redder, Bergkamen-Oberaden; Horst Linke; Dieter Gründken, both of Lunen, and Helmut Temme, Waltrop, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenbutte Westfalia, Fed. Rep. of Germany

Continuation of Ser. No. 198,081, Oct. 17, 1980, abandoned.
This application Nov. 22, 1982, Ser. No. 443,834
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942916
Int. Cl.³ B65G *23/02*
U.S. Cl. 198—834 **9 Claims**



1. A drive frame for a scraper-chain conveyor, comprising:

a pair of generally parallel side plates;

a chain drum and a drive shaft therefor;

a pair of aligned bearing bushes rotatably supporting said drive shaft of said chain drum, said bearing bushes being mounted in apertures in said side plates and being welded to said side plates, respectively, an inner axial end face of each bearing bush being substantially coplanar with an inner surface of said respective side plate and having a radially outwardly extending collar at an outer axial end thereof, an axial dimension of each of said bearing bushes being slightly greater than a wall thickness of said respective side plate, each of said side plates having an outer surface with a recess which surrounds said aperture in that side plate, each of said recesses engaging said collar of said associated bearing bush, each of said bearing bushes having an axially outwardly extending flange at a peripheral edge of its collar; and

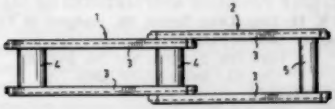
a pair of roller bearings for said bearing bushes, a width of said roller bearings being less than said wall thickness of said respective side plates.

4,437,565

CONVEYOR CHAIN

Aulis Vatja, Eura, Finland, assignor to Lonnstrom Oy, Koylio, Finland

Filed Dec. 8, 1981, Ser. No. 328,480
Claims priority, application Finland, Dec. 22, 1980, 804001
Int. Cl.³ B65G *17/38*
U.S. Cl. 198—851 **2 Claims**



1. A conveyor chain formed of a plurality of inner and outer links, each link comprising a pair of substantially rectangular planar side plates, one of said pair of links having a pair of

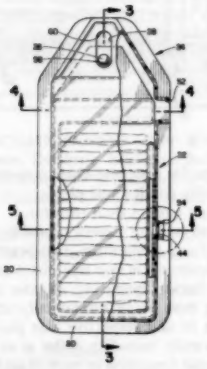
spaced sleeves and the other of said links having a pair of spaced trunnions, said sleeves and trunnions being seated adjacent their ends respectively in said side plates, said sleeves and trunnions being welded to one surface of the respective side plates, and said side plates having a pair of flanges projecting from the surface of said plates to which said sleeves and trunnions are welded, said flange projecting along the longitudinal edges of said plates a distance at least equal to the extension created by said welds.

4,437,566

CHILD PROOF CONTAINER

David J. Szahler, Parma Heights, Ohio, assignor to A Packaging Service Company, Inc., Valley View, Ohio

Filed Jul. 30, 1982, Ser. No. 403,859
Int. Cl.³ B65D *83/00, 5/38, 85/00*
U.S. Cl. 206—1.5 **9 Claims**



1. A container resistant to accidental opening comprising:
an outer housing, an inner tray, actuator means for selectively positioning said inner tray to a first position and a second position; and locking means for locking said tray in said first position;
said locking means including a protruding locking member included in said inner tray disposed generally contiguous to a locking member receiving port of said outer housing comprising an extended sleeve having an extent greater than said protruding locking member to inhibit accidental deflection of said locking member from said sleeve, said locking member being resiliently urged towards said receiving port for close locking reception in said port at said first position.

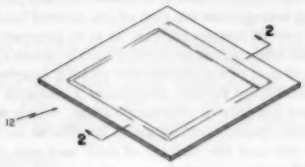
4,437,567

STERILE PACKAGE AND METHOD OF MAKING

David K. H. Jeng, Lake Zurich, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jan. 27, 1982, Ser. No. 343,320
Int. Cl.³ B65D *81/28;* **A61L** *2/18*
U.S. Cl. 206—210 **6 Claims**

1. The method of sterilizing a product which comprises
placing the product incorporating in the package a first sterilization medium comprising a solution containing 0.01 to 0.1% by weight of hydrogen peroxide in an inert liquid solvent in the absence of a second sterilizing medium,
hermetically sealing said package, and allowing said package to stand at a temperature at least as high as room temperature for a time sufficient to provide complete sterilization of the contents of said package.

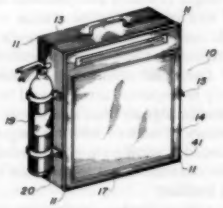


4,437,568

EMERGENCY FIRE AND SMOKE SAFETY KIT

Andrew Hamblin, 17450 Olive Tree Cir., Yorba Linda, Calif. 92686

Filed Aug. 14, 1981, Ser. No. 292,785
Int. Cl.³ B65D *69/00*
U.S. Cl. 206—223 **4 Claims**



1. A rectangular emergency kit for use in fire, flame or smoke situations comprizing in combination:
a rectangular metal box with an earring handle;
a front on said box;
a hinged lid means, all corners on said box are given a radii;
two hasps for closure attached by locking means to the lid means and right side, first aid instructions are attached or printed on the inside and outside of said lid means;
a smoke and fire alarm and self-contained batteries are accomodated in the top space;
next is a three inch space defined by a shelf extending from back to the lid means;
stored on the shelf are:
two rolls of two inch tape,
an air horn,
a can of flourescent red paint,
two heavy duty sponges,
a glass cutter,
a flashlight,
a second space four inches in width defined by a back to lid means shelf;
on the second shelf are:
two respirator masks,
two folded florescent red triangles preprinted with the signal and word "help",
two pair of flame resistant goggles,
a first aid kit,
a third space defined by the bottom of the box to accomodate:
two pair of fire resistant pants,
two pair of fire resistant gloves,
two pair of flame resistant jackets,
two pair of water and flame resistant boots,
two rods to hold the above items, and

a fire extinguisher attached by fastening means to the left exterior of the box.

4,437,569

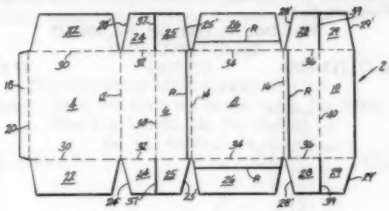
SHIPPING CARTON WITH CASE KNIFE PROTECTION FOR INNER CARTONS

John F. Sorenson, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 398,678, Jul. 13, 1982. This application Sep. 27, 1982, Ser. No. 424,000

Int. Cl.³ B65D *65/26*

U.S. Cl. 206—601 **1 Claim**



1. A package comprising in combination:

(a) a corrugated paperboard shipping carton comprising:

(i) a plurality of side walls interconnected at corner fold lines to form a tubular container;

(ii) a pair of inner end closure flaps foldably connected to each end of a first opposed pair of said side walls along first fold lines;

(iii) a medial fold line extending across each one of said first opposed pair of said side walls, said medial fold lines being parallel to said corner fold lines and extending between said first fold lines;

(iv) outer end closure flaps foldably connected to each end of a second opposed pair of said side walls along second fold lines;

(v) said inner end closure flaps being folded to a carton closing position wherein ones of each pair of said inner end closure flaps diverge away from each other to cause inward bowing of each one of said first opposed pair of said side walls along said medial fold lines; and

(vi) said outer end closure flaps being folded to a carton closing position overlying said inner end closure flaps, and means for securing said outer end closure flaps to said inner end closure flaps to close said carton and to hold said inner end closure flaps in said diverging positions whereby the inward bowing of said first opposed pair of side walls is retained; and

(b) a plurality of rectangular containers disposed in said shipping carton, said containers being arranged serially in face-to-face contact with each other within said shipping carton with endmost ones of said containers being engaged by the inner surfaces of said medial fold lines, said containers further having end walls engaging the inner surfaces of said second opposed pair of side walls on said shipping carton, and there being interior voids within said shipping carton adjacent each of said corner fold lines of said shipping carton which voids are created and maintained by reason of said medial fold lines retaining said endmost containers spaced apart from said corner fold lines, said voids being sized so as to allow knife blade cutting of said shipping carton adjacent said corner fold lines without damaging said containers.

4,437,570

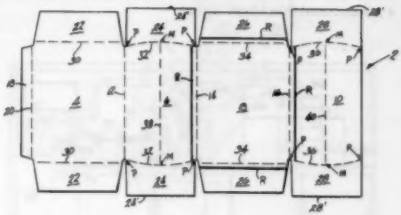
SHIPPING CARTON WITH CASE KNIFE PROTECTION FOR INNER CARTONS

John F. Sorenson, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 15, 1982, Ser. No. 398,678

Int. Cl.³ B65D *65/26*

U.S. Cl. 206—601 **6 Claims**



1. A package comprising in combination a corrugated paperboard shipping carton containing a plurality of product cartons, said shipping carton comprising:

(a) a series of side walls connected together along corner fold lines to form a tubular container;

(b) pairs of inner end closure flaps foldably connected to opposite ends of a first opposed pair of said side walls;

(c) pairs of outer end closure flaps overlapping said inner end closure flaps and foldably connected to opposite ends of a second opposed pair of said side walls along straight fold lines;

(d) said inner end closure flaps each being connected to each of said first opposed pair of side walls along bowed fold lines with a medial portion of each bowed fold line being closer to an outer free edge of the respective inner end closure flap than end portions of said bowed fold line;

(e) a medial fold line on each of one of said first opposed pair of side walls extending between said medial portions of said bowed fold lines; and

(f) each of said first opposed pair of side walls being bowed inwardly of said container along said medial fold lines, and each of said inner end closure flaps being bowed outwardly of said container whereby side edges of said inner end closure flaps are inwardly offset from said straight fold lines when said end closure flaps are folded to a container-closing position said bowing of said first opposed pair of side walls and said inner end closure flaps being operable to offset said product cartons disposed in said container from the corner fold lines defining side edges of said first opposed pair of side walls and from said straight fold lines wherein the container can be cut proximate the corner fold lines and proximate said straight fold lines without risking damage to said product cartons.

4,437,571

THIN SHEET SORTING APPARATUS

Hideo Ohmura, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 8, 1981, Ser. No. 309,846

Claims priority, application Japan, Oct. 13, 1980, 55-14193

Int. Cl.³ B07C *5/344*

U.S. Cl. 209—551 **9 Claims**

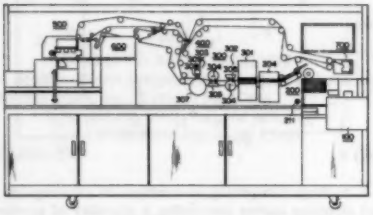
1. A thin sheet sorting apparatus comprising:

sheet transfer means for transfering a first group of sheets including a given number of sheets one by one from a reservoir of unsorted sheets to a sheet transport path;

sheet inspection means, disposed along said sheet transport path, for inspecting the sheets transferred from said sheet transfer means, and discriminating among three classes of sheets including effective sheets, countable unidentifiable sheets, and uncountable unidentifiable sheets;

sheet allotting means, disposed along said sheet transport path and through said sheet inspection means, for allotting the effective sheets and a group of sheets including both of the countable and uncountable unidentifiable sheets, which were discriminated by said sheet inspection means, to an effective sheet section and a rejected sheet section, respectively;

counting means, connected to said inspection means for detecting whether there are no uncountable unidentifiable sheets and in response to such a determination, producing a no-uncountable sheet signal;



collation means, connected to said detecting means and said counting means, for collating the sum of the number of the effective sheets and the number of the countable unidentifiable sheets with a set number in response to a no-uncountable sheet signal from said detecting means and producing in response thereto a collation signal indicative of completion of the sorting of said first group of sheets from said reservoir; and

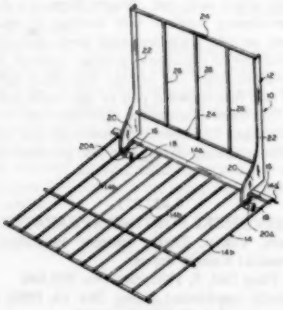
sheet supplying means, connected to said collation means, for supplying a second group of sheets having said given number from said reservoir to said sheet transfer means in response to the collation signal from said collation means.

4,437,572

SHELF RETAINER

Howard O. Hoffman, Elmhurst, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed Jun. 8, 1981, Ser. No. 271,493
Int. Cl.³ A47F 5/00
U.S. Cl. 211—86 **8 Claims**



1. A unitary retainer for linear and angular adjustable installation on a shelf having longitudinally extending openings defined by spaced apart longitudinally extending shelf members, comprising:

barrier means adapted to be positioned along an edge of said shelf, said barrier means including a pair of base portions supporting said barrier means on said edge of said shelf, said barrier means serving to retain articles on said shelf; and

means for releasably securing said barrier means to said shelf, said releasable securing means being associated with said base portions of said barrier means and including means for engaging said longitudinally extending shelf members in at least two positions, said positions including an article retaining position and an article access position;

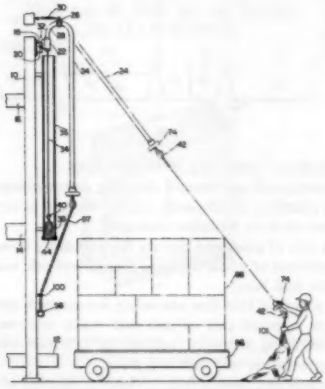
said barrier means also including a pair of end members joined by a planar barrier, one of said base portions being integral with each of said end members such that at least a part of said base portions is adapted to extend downwardly between longitudinally extending shelf members, said engaging means being integrally associated with said downwardly extending part of said base portions.

4,437,573

BOOM RACK FOR HANDLING AND POSITIONING CARGO TIE DOWN EQUIPMENT

Frank Garoffolo, Westport, Conn., assignor to Aviatec, Inc., Westport, Conn.

Filed Dec. 31, 1981, Ser. No. 336,225
Int. Cl.³ B66C 23/20
U.S. Cl. 212—263 **11 Claims**



1. A boom rack of the type adapted for handling and positioning cargo tie down equipment, comprising:

A. A base fulcrum mount;

B. A tube coupling pivoted to said base fulcrum mount upon a horizontal axis;

C. An inverted J-shaped tube secured within said tube coupling at its foreshortened end and extending upwardly, outwardly and downwardly with respect to said tube coupling; and

D. A counter-weighted cable having its free end extending through said inverted J-shaped tube, so as to engage and support a cargo net hook outwardly thereof.

4,437,574

TAMPER-RESISTANT BOTTLE CAP

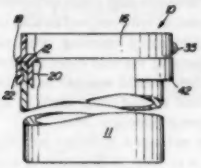
William Ruklic, 549 Chestnut La., Beecher, Ill. 60401

Filed Oct. 14, 1981, Ser. No. 311,307
Int. Cl.³ B65D 41/46
U.S. Cl. 215—247 **25 Claims**

1. A tamper resistant closure cap for a cylindrical receptacle open at one end and having a peripheral outwardly-projecting catch at the open end, said cap having a top wall comprising:

(a) an annular platform having a pair of radially-spaced, peripherally-extending collars depending from its bottom surface, the inner of said depending collars having an outer diameter substantially the same as the inside diameter of said receptacle but gauged for engagement with the inner surface of the receptacle, and the outer one of said depending collars being gauged to fit the open end of the

receptacle and having latch means on its inner surface gauged for snap-fit engagement with the catch means of said receptacle;



(b) means for removing the outer one of said depending collars of said closure cap; and

(c) the top wall having an annular filler opening therein, and a closure plug being provided for said opening.

4,437,575

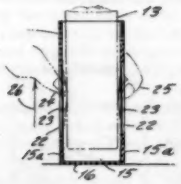
COUNTERTOP MINI-GARBAGE CAN

Geraldine L. Hahn, 351 189th St., Miami Beach, Fla. 33160

Filed Feb. 7, 1983, Ser. No. 464,685

Int. Cl.³ B65D *25/14*

U.S. Cl. 220—1 T **1 Claim**



1. A countertop mini-garbage can, comprising, in combination, a container and a pivoted cover upon a top of said container for selectively closing a top opening of said container, said container comprising four vertically elongated side walls and a horizontal bottom wall, said container being of a size and shape for receiving a conventional paper milk carton, amd means for grasping and upwardly lifting said carton outward of said container, said means comprising a vertically elongated opening made through a pair of opposite said side walls, a thin, stretchable rubber film adhered all around an edge of each said openings for sealing an interior space of said container, and in use being stretchable in a vertical direction; a receptacle on an underside of said cover, said receptacle containing a replaceable deodorant; and said cover having a projecting tab on a front edge thereof.

4,437,576

DRINKING VESSEL WITH SELF-CONTAINED STRAWS

Richard L. Barniak, Morgan Gulf Rd., Turin, N.Y. 13473

Filed Sep. 30, 1982, Ser. No. 429,385

Int. Cl.³ B65D *41/26, 25/38, 8/02*

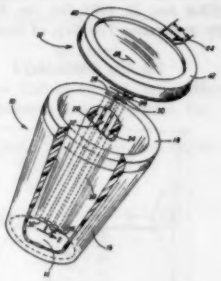
U.S. Cl. 220—90.4 **5 Claims**

1. A drinking vessel comprising, in combination:

(a) liquid container means having a bottom wall and a side wall extending from said bottom wall to an open end defined by a circular lip having a constant, symmetrical width about its entire periphery;

(b) conduit means extending through said side wall between an open lower end communicating with the interior of said container means in the area of said bottom wall and an open upper end in the area of said lip; and

(c) cover means having a circular, symmetrical flange portion adapted for frictional, releasable sealing engagement with said lip about the peripheral extent thereof, and a second portion covering said container open end, said cover means including an opening in said flange portion extending a predetermined portion of the periphery thereof, said flange portion being selectively engageable



with said lip in any desired relative rotational orientation, whereby said opening may be placed in or out of registration with said conduit means upper end, thereby permitting or blocking communication with the vessel contents through the conduit and cover means.

4,437,577

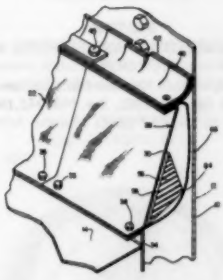
DOUBLE SECONDARY SEAL FOR FLOATING ROOF TANKS

James F. Myers, First & Curtis Ave., Thorofare, N.J. 08086, and Lloyd C. Thoemke, 3737 Chichester Ave., Boothwyn, Pa. 19061

Filed Sep. 3, 1982, Ser. No. 414,871

Int. Cl.³ B65D *87/207*

U.S. Cl. 220—224 **19 Claims**



1. A secondary seal for a liquid storage tank having a cylindrical sidewall and a floating roof comprising

a weather shield means extending upwardly and outwardly from the floating roof to normally seal the peripheral junction between the roof and the sidewalls,

the weather shield means terminating upwardly in a flexible wiper which is normally in contact with tank sidewall;

a vapor barrier means extending about the weather shield means to prevent the passage of vapors through the weather shield means,

the vapor barrier means defining a log space outwardly of the weather shield means; and

a resilient reserve seal means positioned within the log space to provide a reserve seal between the weather shield means and the tank sidewall when the flexible wipers do not contact the tank sidewall.

4,437,578

CONTAINER AND CLOSURE MEANS FOR STORAGE OF RADIOACTIVE MATERIAL

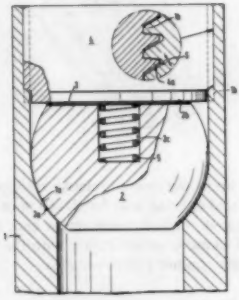
Heinz Bienek, Oberhausen; Rudolf Finkbeiner, Ratingen, and Wilhelm Wick, Essen, all of Fed. Rep. of Germany, assignors to Steag Kernenergie GmbH, Essen, Fed. Rep. of Germany

Filed Jun. 22, 1982, Ser. No. 390,956

Claims priority, application Fed Rep. of Germany, Feb. 9, 1982, 3204300

Int. Cl.³ B65D *51/18*

U.S. Cl. 220—256 29 Claims



12. A storage device consisting of a container for the final storage of radioactive substances and a cover for the container, wherein one of the container and cover consists of a material selected from ceramic and metallic material, and wherein the container and cover are suitably ground on their seating areas which cooperate with each other, and a prestressing device is provided which is supported on the container and engages the cover, this prestressing device prestressing the cover against the seating area of the container.

4,437,579

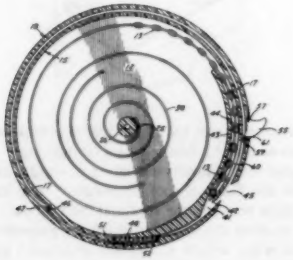
DRUG DISPENSING APPARATUS AND REMOVAL TOOL

Donald R. Obland, 6750 S. Clermont St., Littleton, Colo. 80122

Filed Jan. 25, 1982, Ser. No. 342,196

Int. Cl.³ B65D *83/04*

U.S. Cl. 221—25 14 Claims



1. A child-proof dispenser for a strip of drugs and the like comprising:

a container having an inner compartment for enclosing a coiled strip of drugs, said container including separate, interfitting, inner and outer shells, said inner and outer shells having releasably interlocking central hub portions holding said shells together and supporting said outer shell to rotate relative to said inner shell, said inner shell having an inner dispensing opening and said outer shell having an outer dispensing opening, said inner shell having an inside guide section forming a guide passage leading to said inner dispensing opening and a cut-off blade defining one side of said inner dispensing opening;

biasing means between said shells to move said outer shell to an at-rest position with respect to said inner shell to cover said inner dispensing opening with said outer shell to prevent dispensing via said inner dispensing opening until said inner shell is held against movement and a turning force is applied to said outer shell to aline said inner and outer dispensing openings; and

ejecting means arranged to move relative to said shells to bear against a portion of said strip in said guide passage to advance said strip through said alined inner and outer dispensing openings and remove the dosage from the strip by cutting the strip on said cut-off blade.

4,437,580

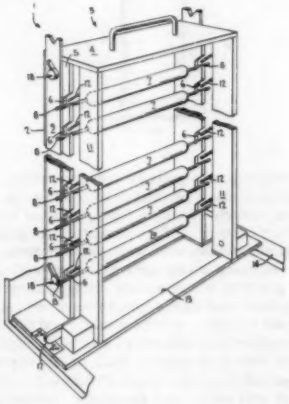
DISPENSER FOR SKEWERED FOODS

Wayne Ferrin, Sanford, N.C., assignor to Frieda Boosalis, Fayetteville, N.C.

Filed May 21, 1982, Ser. No. 380,768

Int. Cl.³ B65H *29/34*

U.S. Cl. 221—75 11 Claims



1. Dispensing apparatus for sequentially dispensing a plurality of articles comprising:

(a) a housing including discharge means for discharging said articles;

(b) at least one dispensing cartridge removably disposed within said housing adapted for storing said articles in superposed relationship with respect to one another, said cartridge including

(i) a frame having a pair of vertical side members;

(ii) a plurality of support means associated with said side members for supporting said articles in superposed relationship with respect to one another within said cartridge; and

(iii) guide means associated with said support means for guiding an article displaced from one support means to the next subjacent support means or from the last support means to the discharge means; and

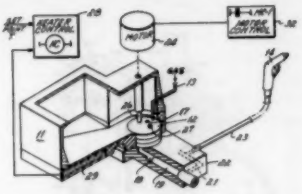
(c) displacing means operatively associated with said dispensing cartridge for displacing said articles from said support means.

4,437,581

PUMP MOTOR MASTER CONTROL

William R. Coker, Lilburn, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Nov. 27, 1981, Ser. No. 324,672
Int. Cl.³ B67D 5/08
U.S. Cl. 222—54 5 Claims



1. In a hot melt adhesive dispensing arrangement having an adhesive tank, a heater for heating the tank, a pump for pumping molten adhesive from the tank, and a motor for driving the pump, a master control for preventing the operation of the motor until the adhesive has reached a dispensable molten state comprising:

a master control circuit having an input and having means for enabling the operation of the motor in response to the presence of a condition at the input for a finite delay interval equal to a predetermined period of time;

means for sensing the temperature of the tank;

a heater control coupled to the temperature sensing means and to the heater and operable to energize the heater when the temperature of the tank falls below a predetermined temperature; and

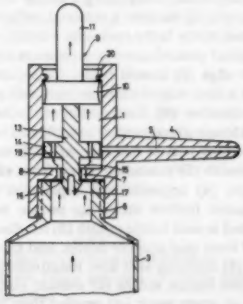
means for producing said condition at the input of the master control circuit when the heater is not energized, whereby, as the adhesive is heated by the tank and each period of time during which the heater is not energized increases in duration, said predetermined period of time is reached and the operation of the motor is enabled.

4,437,582

DEVICE FOR DISPENSING PASTE-LIKE SUBSTANCES

Florian Dörner, Düsseldorf, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 414,225
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137760
Int. Cl.³ B05B 11/04
U.S. Cl. 222—94 8 Claims



1. A device for dispensing paste-like substances from tubes comprising: a metering chamber having a base which is provided with inlet openings and side walls with an outlet opening and which has means screwable onto the tube, an axially displaceable plunger comprising an externally operable pushrod is disposed in the metering chamber and a plate valve having bores for the passage of the product is mounted for axial displacement in the metering chamber, the plate valve being configured to close the outlet opening during filling of the metering chamber and the inlet openings during emptying of the metering chamber.

4,437,583

DRIBBLE RING

Rodney J. O'Connor, College Station, Tex., assignor to Romec Environmental Research & Development, Inc., College Station, Tex.

Filed Dec. 21, 1981, Ser. No. 332,547
Int. Cl.³ B67D 1/16
U.S. Cl. 222—108 15 Claims

1. An apparatus for capturing liquid dripping down the sides of a liquid container, which comprises:

an absorbent material wrapped around the outside of a liquid container; and

said absorbent material being impregnated with a chemical agent selected to chemically neutralize the liquid dripping down the sides of the liquid container.

4,437,584

TOOTHPASTE DISPENSER

Stephen T. Connors, Sale, and Harvey, Kenneth, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,289
Int. Cl.³ B67D 5/52
U.S. Cl. 222—137 6 Claims

1. A dispenser for delivering two products comprising

a container having a neck and a bottom closure,

a tube movably extending through said neck into the container and having a plunger and outlet outwardly of the container and a pipe within said tube and extending below said tube,

a first uni-directional movable semi-flexible plate disposed in said container,

first ratchet means connected to said tube and extending through said first plate for moving said first plate to displace a first product in said container towards said tube,

a second uni-directional movable semi-flexible plate in said container, and

second ratchet means on said pipe extending through said second plate for moving said second plate to displace a second product into said pipe.

4,437,585

DISPENSERS

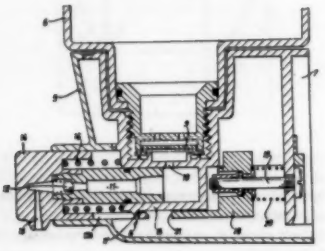
Stewart Banks, Derby, England, assignor to Appor Limited, Derby, England

Filed Mar. 12, 1981, Ser. No. 242,870

Claims priority, application United Kingdom, Mar. 15, 1980, 8008837

Int. Cl.³ B67D *5/06*

U.S. Cl. 222—181 **5 Claims**



1. A dispenser including a delivery mechanism for dispensing measured quantities of material contained in the dispenser, means for adjusting the measured quantity dispensed at each operation of the dispenser, and means mounting the adjustment to be accessible from externally of the dispenser at a rear location thereof, so that when the dispenser is mounted on a wall or other support the adjustment means is inaccessible to an operator until the dispenser is removed from the wall or other support, the dispenser including a separable mounting plate adapted to be secured to a supporting structure and having means for slidably receiving the dispenser so as to mount the same on the mounting plate, and releasable latch means being provided to enable disengagement of the dispenser from the mounting plate whereby to permit access to said adjustment means, said latch means comprising a resilient projection carried by said mounting plate and resiliently biased into a locking position in which it engages with a portion of the dispenser, the projection being resiliently deformable away from said locking position to a retracted release position by use of a special tool engageable with the latch member through an access opening formed in the dispenser or in the mounting plate.

4,437,586

MECHANICALLY ACTUATED PIPETTE DISPENSER

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,931

Int. Cl.³ B67D *5/06;* **G01F** *11/06*

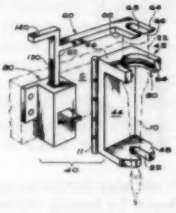
U.S. Cl. 222—181 **8 Claims**

1. In a dispenser including

a pipette comprising means at a first end for containing liquid for dispensing, a compression chamber in fluid communication with said first end, compressing means, including a piston, for providing fluid compression within said chamber, and means for venting said chamber to the atmosphere, and

actuating means including mounting means for receiving said pipette and for removably securing the compression chamber of said pipette in a fixed position and means for engaging and moving said compressing means by a predetermined distance to dispense a fixed amount of liquid;

the improvement wherein said actuating means includes moving and sealing means, operable during receipt of said pipette, for sequentially: (1) moving said piston with said



chamber in a vented condition, to a predetermined starting position relative to said mounting means while said actuating means is stationary with respect to said compression chamber, and (2) thereafter sealing said venting means,

whereby said piston is automatically initialized without dispensing any of the liquid contained by said pipette.

4,437,587

SQUEEZE BOTTLE FOR PRODUCING AN ARBITRARILY DIRECTED LIQUID STREAM

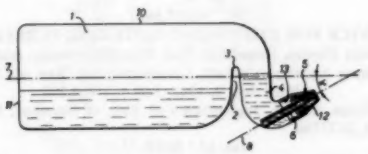
Walter Duering, Zurich, Switzerland, assignor to Duering AG, Daellikon, Switzerland

Filed Jun. 22, 1981, Ser. No. 275,963

Claims priority, application Switzerland, Jul. 3, 1980, 5117/80

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—207 **11 Claims**



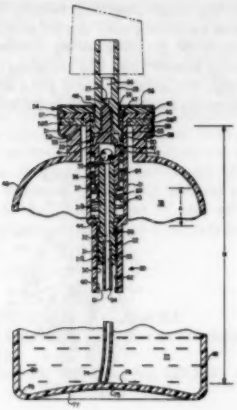
1. A squeeze bottle, comprising a bottle body having bottle body wall means **(1)** made of a material sufficiently flexible for squeezing, said bottle body enclosing a bottle volume having a first longitudinal central axis **(7)**, separation means **(2)** forming an overflow edge **(3)** in said bottle for separating said bottle volume into a first larger chamber and into a second smaller bottle neck chamber **(4)**, bottle content discharge means having a second longitudinal central axis **(8)** and including a bottle mouth **(5)** forming part of said second bottle neck chamber **(4)**, said bottle mouth **(5)** extending away from said second bottle neck chamber **(4)** opposite said separation means **(2)**, said discharge means further including nozzle means **(6)** operatively mounted in said bottle mouth **(5)** for discharging a quantity of liquid from said squeeze bottle, said second longitudinal central axis **(8)** crossing said first longitudinal central axis on the side of said nozzle means **(6)** outside said bottle body **(1)** and enclose an acute angle (α) smaller than 50°, whereby the bottle content may be squeezed out as a stream directed in substantially any desired direction, and wherein said separation means **(2)** forms a double walled restriction in said bottle body wall means, said restriction extending into said bottle body between said larger chamber and said smaller bottle neck chamber.

4,437,588

ACCUMULATIVE PRESSURE PUMP

Joseph J. Shay, Waterbury, Conn., assignor to Ethyl Products Company, Richmond, Va.

Filed Dec. 29, 1981, Ser. No. 335,368
Int. Cl.³ B65D 47/34
U.S. Cl. 222—321 15 Claims



1. In a pump dispenser adapted to be attached to a container holding a liquid to be dispensed, the combination comprising:

(a) means defining a cylindrical pump body having a first section and a second section, said second section being of a smaller diameter than said first section;

(b) a first piston received in said first body section and having an attached first stem means having a fluid passage therein extending out of said body section;

(c) a second piston received in said second body section and having an attached second stem means having a fluid passage in its lower portion and a solid upper portion normally contacting said first stem means to close the fluid passage therein;

(d) a third seal piston attached to said second stem means between said first piston and said second piston, and having an outwardly flared skirt that makes a sealing engagement with the uppermost portion of the interior wall of said second body section when said third seal piston is moved to its lowermost position;

(e) a dip tube means having its upper portion passing through an opening of larger diameter than said dip tube that is provided in the lower end of said second body section, the dip tube upper end being coupled to said second piston and movable therewith; and,

(f) means provided on the wall of said second body section to cooperate with said second piston to permit air entrapped in said first and second body sections to be discharged through the opening in the lower end of said second body section into the air space of said container upon the priming of the pump.

4,437,589

DISPENSING CARTRIDGE

Charles Potter, Stow, Ohio, assignor to Go-Jo Industries, Inc., Cuyahoga Falls, Ohio

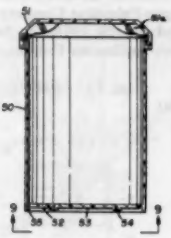
Continuation of Ser. No. 177,269, Aug. 11, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,856
Int. Cl.³ B65D 88/54
U.S. Cl. 222—327 3 Claims

1. A two-piece cartridge for storage and transportation of a fluid and use with a dispensing device of the type which includes a cartridge receiving body and a vacum inducing pump in fluid communication with the cartridge receiving body for drawing material from the cartridge, comprising:

(A) an elongate body having a side wall and first and second ends;

(B) an integral one-piece bottom wall detachably connected to said side wall by a peripherally extending reduced thickness web and normally closing off said first end;

(C) a top cap removably receivable on said second end and normally disposed in sealing relationship therewith;



(D) said second end being receivable on the cartridge receiving body of the dispenser when said top cap is removed;

(E) said bottom wall having a diameter less than the internal diameter of said body, freely resting on the fluid contents of said cartridge in spaced relationship with the sidewall of said body upon being detached from said first end of said wall; and

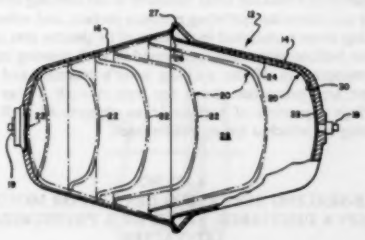
(F) said top cap being receivable on said first end in air permeable relationship thereto when said cartridge is received on the cartridge receiving body of the dispenser.

4,437,590

POSITIVE EXPULSION FLUID STORAGE TANKS

Anthony J. LaBruna, Clarence, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Mar. 22, 1982, Ser. No. 360,458
Int. Cl.³ B67D 5/00
U.S. Cl. 222—386.5 6 Claims



1. In a tank of the type which is adapted to be initially substantially filled with a supply of fluid to be expelled therefrom by means of fluid pressure forces acting against a diaphragm which has a side wall portion and convex crown portion shaped to initially lie snugly against an approximately one-half portion of the interior surface of said tank and a rim portion anchored to a mid-portion of said tank, whereby upon admission into said tank of said fluid pressure forces said supply fluid may be substantially completely expelled therefrom by way of an exit in response to rolling inversion of said diaphragm into a reverse shaped configuration fitting against the opposite one-half portion of the interior surface of said tank, the improvement comprising:

said side wall portion being of progressively increasing sectional thickness leading from said rim portion toward

said crown portion, said crown portion being of progressively decreasing sectional thickness leading radially inwardly from said side wall portion toward the center thereof, and said rolling inversion of said diaphragm commences adjacent said rim portion.

4,437,591

DISPENSER FOR, IN PARTICULAR, PASTY SUBSTANCES

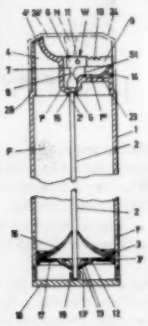
Alfred von Schuckmann, Kevelaer, Fed. Rep. of Germany, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,406

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007480

Int. Cl.³ G01F *11/00*

U.S. Cl. 222—391 **7 Claims**



1. A dispenser, particularly for pasty substances, which comprises a tubular housing with a dispensing mouthpiece at one end and a piston which is displaceable inside the housing towards the mouthpiece to force material out of the mouthpiece by means of an operating handle located at the mouthpiece end and a draw member linking the operating handle to the piston wherein the draw member is formed as a rod which is coupled with the piston via an unidirectionally-operating ratchet arrangement, the rod being coupled to one arm of a double-armed rocking lever mounted in the housing and whose other arm forms an operating pressure surface, and wherein the rocking lever is enclosed in the area of its shorter arm in a step whose hollow side walls are provided with bearing openings for snapping in of the rocking lever's journals and whose longer arm protrudes above the step in such a way that it overlaps a portion of surface of an upperfront wall of the housing on which a spring braces itself.

4,437,592

SELF-SEALING ACTUATING DEVICE FOR MOUNTING ON A DISCHARGE VALVE OF A PRESSURIZED CONTAINER

Luigi D. Bon, 141 Feldstrasse, 4663-Aarburg, Switzerland

Filed Dec. 19, 1980, Ser. No. 218,083

Claims priority, application Switzerland, Dec. 21, 1979, 11369/79; May 16, 1980, 3819/80

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—402.12 **15 Claims**

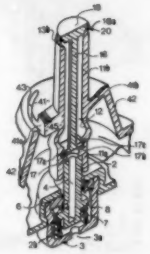
1. A self-sealing actuating device adapted for being mounted on the valve body, having an outlet channel, of a self-closing discharge valve of a pressurized container from which a liquid product is to be dispensed with the aid of a propellant in liquid, pasty or foamy condition, which actuating device opens automatically when an external part thereof is moved in a given direction, and comprises

(a) as said external part, a tubular actuating member having two open ends, a first one of which is destined to register with the said outlet channel, when said actuating device is mounted on said valve body, the other open end constituting a discharge orifice of said device; and a tubular passage connecting said two open ends;

(b) an obturating member lodged stationary in said tubular passage and having an obturating head for obturating said discharge orifice hermetically from the outside, when said tubular actuating member is in a closed position,

(c) anchoring means extending radially in said tubular passage in an anchoring zone thereof axially spaced from said other open end of said actuating member, and holding said obturating member and said actuating member in engagement with one another in said zone, and

(d) spring means associated with said tubular actuating member and adapted for biassing said actuating member toward said closed position when said actuating member is brought into an open position;



said actuating member being axially displaceable relative to said obturating member, between said anchoring zone and said other second open end thereof, between said open and said closed positions,

whereby, when said tubular actuating member is moved toward the open position, by an axial force directed away from said discharge orifice, against bias applied to said tubular member by said spring means being compressed, said obturating head protrudes out of said discharge orifice and frees said discharge orifice in the form of an annular gap.

4,437,593

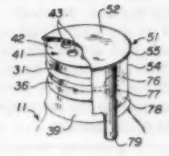
OVERCAP FOR SPICE CANISTER

Joseph J. Bullock, III, Atherton, Calif., assignor to Three Sisters Ranch Enterprises, San Carlos, Calif.

Filed Jul. 12, 1982, Ser. No. 397,609

Int. Cl.³ B65D *83/06*

U.S. Cl. 222—541 **4 Claims**



1. In combination, a cap having a central top first disc, a thin-walled substantially cylindrical first skirt depending from adjacent the periphery of said first disc, said first skirt being scored and weakened in a circumferential first line spaced downwardly from the top of said first skirt and in a second line joining said first line and extending down to the bottom edge of said first skirt, a tab attached to said first skirt adjacent said second line, an upper internal circumferential bead on said first skirt between said first line and said disc, a lower internal

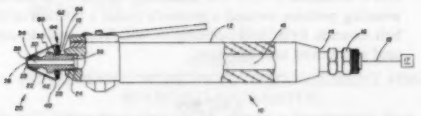
circumferential second bead on said first skirt below, but adjacent, said first line, a fitment having a second disc formed with sifter holes and a short peripheral depending second skirt, the exterior of said second skirt being cylindrical and of an outer radius to seal tightly against the inside of said first skirt immediately below said first disc, the interior of said second skirt terminating in an internal third bead, and a container having a neck, the exterior of said neck having a fourth bead near its top shaped to fit inside the top of said second skirt and a first groove below said fourth bead shaped to receive said third bead, a fifth bead and a sixth bead vertically spaced from said fifth bead, each of said fifth and sixth beads having shoulders on their lower edges, said first and second beads fitting under the shoulders of said fifth and sixth beads, respectively, said first skirt sealing the contents of said container from deterioration by exposure to air both when said first skirt is intact and also after the portion of said first skirt below said first line has been torn away, the maximum radii of said fifth and sixth beads being about equal to the outer radius of said second skirt whereby said first and second beads may slide over said second skirt.

4,437,594

RETAINABLE CLOSURE

Clyde D. Sprague, Lilburn, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Dec. 10, 1981, Ser. No. 329,543
Int. Cl.³ B65D *47/00*
U.S. Cl. 222—544 **6 Claims**



1. A retainable closure for selectively atmospherically isolating a passageway in a fitting, the closure comprising:

a retainer;

an elastic cover secured to said retainer, said cover being selectively positionable between a first and a second position, when in said first position said cover sealingly contacts an orifice in which the passageway terminates so as to atmospherically isolate the passageway, and when in the second position said cover is retainable removed from the orifice so as to allow unimpeded passage past the orifice and wherein said retainer is connected to the fitting, said retainer comprises an eyelet, a washer and a grommet washer, and said cover being elongate and having opposite ends, one of said ends is sandwiched between said eyelet and said washer, and other of said ends of said cover is sandwiched between said washer and said grommet washer so that said cover is secured to said retainer so as to loop towards said orifice.

4,437,595

FEEDING APPARATUS FOR FISH AND OTHER ANIMALS

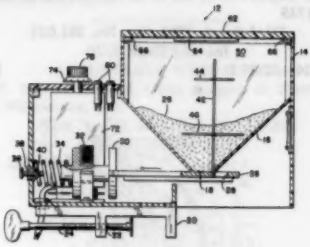
Perry Stevens, West Covina, and Robert E. Brown, Rosemead, both of Calif., assignors to A.F.C.S., Inc., City of Industry, Calif.

Filed Feb. 11, 1982, Ser. No. 347,895
Int. Cl.³ A01K *5/02*
U.S. Cl. 222—642 **3 Claims**

1. Dispensing apparatus for dispensing an associated fluent material which comprises:

at least first and second housing means for receiving the fluent material, each housing means having a top and a bottom, said bottom having an opening therein;

a slide member having at least first and second openings therein, said slide member being mounted for movement adjacent to said bottoms of each of said first and second housing means between a first position wherein said openings of said first and second housig means and said first and second openings respectively of said slide member are in at least partially registered relationship to allow passage of the fluent material through said openings, and a second position wherein said openings are not in registered relationship and passage of a fluent material out of said holding means is prevented;



adjustable solenoid means for moving said slide member including throw adjusting means to allow control of said at least partially registered relationship of said openings;

first timing means connected to control said adjustable solenoid operating means to move said slide member from said second position to said first position and back to said second postion for a predetermined time period; and

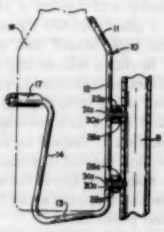
second timing means connected to initiate operation of said first timing means at a chosen time of day.

4,437,596

ASSEMBLY FOR MOUNTING A WATER BOTTLE CAGE ON A CYCLE FRAME

William B. Shook, Bremen, Ohio, assignor to Thurston, Inc., Columbus, Ohio

Filed Jul. 15, 1982, Ser. No. 398,663
Int. Cl.³ B62J *11/00*
U.S. Cl. 224—39 **8 Claims**



1. A wire cage for receiving a bottle or the like in combination with an assembly for mounting it on a support; said wire cage being formed with a socket into which the bottle is inserted and removed therefrom and including longitudinally-extending back wire sections along which the bottle slides during insert and removal; said mounting assembly including a cradling block for receiving the wire sections, and fastening means for fastening the block to the support and engaging the wire sections rearwardly of the forwardmost surfaces thereof so as to clamp the wire sections to the block in a manner not to interfere with the sliding movement of the bottle thereon; said back wire sections being disposed in laterally-spaced relationship, said fastening means of the mounting assembly comprising a screw which is passed between the back wire sections

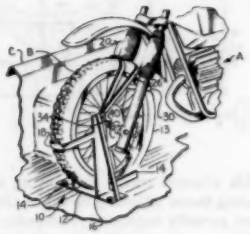
through the block and which has a clamping head for engaging the wire sections, said wire sections being provided with opposed notches to form a countersink socket for the screw head so it will be below the surfaces of the wire sections engaged by said bottle and will also preclude longitudinal and torsional movement of the wire sections relative to the cradling block.

4,437,597

MOUNTING APPARATUS FOR A DIRT BIKE

Richard H. Doyle, 901 S. 6th Ave., Sp 406, Hacienda Heights, Calif. 91745

Filed Jul. 6, 1981, Ser. No. 281,024
Int. Cl.³ B60R *9/10*
U.S. Cl. 224—42.45 R **16 Claims**



1. Mounting apparatus for a vehicle having a plurality of wheels having tires thereon which comprises:

support means,

a first generally U-shaped member for preventing movement of the vehicle in a first generally horizontal direction by engagement with one of said tires, said first generally U-shaped member being carried on said support member,

means for preventing movement in a second generally horizontal direction which is opposite to said first direction by engagement with the one tire,

said means for preventing movement in a second generally horizontal direction comprising at least a second generally U-shaped member which is pivotally mounted on said support means, said second generally U-shaped member having first and second legs disposed in spaced generally parallel relationship and having a pivot axis extending substantially in a plane defined by said first and second generally parallel legs thereof, said second generally U-shaped member having a mid-section disposed intermediate said first and second legs thereof, said second generally U-shaped member being dimensioned and configured for motion about said pivot axis between first and second positions, said second U-shaped member being disposed with said mid-section thereof disposed in contacting relationship with an associated tire of the associated vehicle in said first position and disposed away from said associated tire in said second position,

said means for preventing motion in a second generally horizontal direction further including a third generally U-shaped member, and

means for pivotally mounting said third generally U-shaped member.

4,437,598

BELT BUCKLE

Evan B. Hull, 49 Pleasant St., Northboro, Mass. 01532

Filed Apr. 2, 1982, Ser. No. 365,036
Int. Cl.³ A45C *1/04*
U.S. Cl. 224—163 **6 Claims**

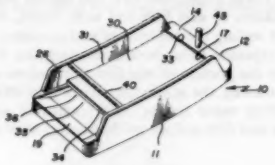
1. Buckle for use with a belt comprising:

(a) a main body portion having a front end, a back end, and a generally planar outer wall with an inner surface,

(b) a back wall extending inwardly from said inner surface at said back end,

(c) a pair of side walls extending inwardly from said inner surface at opposite sides of said main body portion between said front and back ends,

(d) a generally planar inner wall fixed to said back and side walls and spaced from said inner surface to define a compartment with said inner surface, back and side walls, said compartment having an opening at said front end for receiving currency and other valuable papers for storage in said compartment,



(e) a front wall extending inwardly from said inner surface at said front end, said front wall being substantially spaced from said opening,

(f) first attaching means for releasably securing one end of a belt to said back end, and

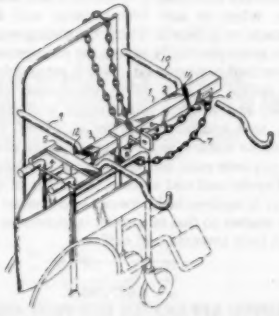
(g) second attaching means for more permanently securing the other end of the belt to said front end so that when the belt is attached to said first attaching means in its normal wearing position around a person's waist, a portion of the belt extends from said opening to said front wall to conceal and cover said opening.

4,437,599

BICYCLE/WHEELCHAIR CARRIER

Harold G. Jordening, 1541 E. LaPalma, Anaheim, Calif. 92804

Filed Feb. 22, 1982, Ser. No. 351,328
Int. Cl.³ B60R *9/00*; B62H *3/00*
U.S. Cl. 224—319 **2 Claims**



1. A device for adapting a vehicle-mountable bicycle carrier with its projecting horizontal support pieces on which there rests a bicycle cross bar, the adaptation permitting the carrying of a collapsed wheelchair having two rearwardly projecting horizontal hand grips wherein the adaptation includes an extensible member which lies horizontally on the projecting bicycle support pieces, the extensible member having larger and smaller telescoping pieces, the improvements comprising:

a cross-piece attached to the end of the smaller telescoping piece, a generally U-shaped member joined to the cross-piece at each end of each leg of said U-shaped member with the base of said U-shaped member with the base of said U-shaped member spaced from said cross-piece, said

base serving as a support for the handgrips of a wheelchair said cross-piece functioning to prevent the hand grips from moving off said base transport of the wheelchair,

the larger piece of the extensible member having a ring attached to its bottom surface, the ring functioning to contain a loop of cable which supports the front end of the collapsed wheelchair, the ring further functioning as a projection to inhibit the horizontal extensible member from moving sideways off the bicycle support pieces.

2. On a bicycle carrier frame having two projecting pieces spaced apart which normally function to support the bicycle, attachments to the projecting pieces to allow the carrying of a collapsed wheelchair comprising:

a horizontal piece perpendicular to and connecting the projecting pieces, the horizontal piece functioning as a stiffener to the two projecting pieces of the bicycle carrier,

two "U" shaped configurations, a first "U" shaped hanger configuration, lying substantially in a vertical plane, being attached to the underside of one of the projecting pieces of the bicycle carrier and lying in said vertical plane which includes the projecting piece, the attachment points being the tops of the legs of the "U", the bottom of the first "U" shaped piece serving as a hanger support for the wheelchair hand grips; at each of the two corners of the first "U" there being attached a horizontal bar extending generally parallel to said stiffener toward the other projecting piece of the bicycle carrier and together forming the legs of the second "U" shaped piece, each bar formed at its end to provide for one pin to be threaded through the ends of each, a means for locking the pin in place, the pin being the base of said second "U", the pin functioning to prevent the wheelchair hand grips from jumping off the bottom of the first "U".

4,437,600
CONTINUOUS WIRE FEED ARRANGEMENT FOR STAPLING APPARATUS

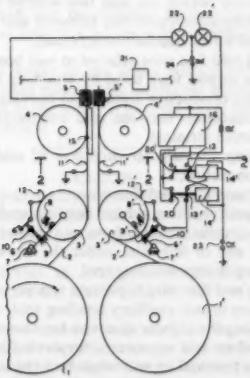
Rudolf Störr, Karl-Marx-Stadt, German Democratic Rep., assignor to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 273,552, Jun. 15, 1981, abandoned. This application Jul. 8, 1981, Ser. No. 283,020

Claims priority, application German Democratic Rep., Jun. 17, 1980, 221882

Int. Cl.³ B65H *17/04*

U.S. Cl. 226—108 **8 Claims**



1. A continuous wire feed arrangement for feeding wire to a stapling apparatus or the like, comprising two wire supply means; two wire guide nozzles respectively arranged along paths leading from the respective wire supply means to a wire cutting and transmitting device; wire feed means positioned between said wire supply and said guide nozzles in said paths and operative for respectively transporting the wires from the wire supply means through and beyond the respective means; and electrical control circuit means including two guide rolls of electrically conductive material and insulated from the ground each arranged between the respective wire supply means and said wire feed means cooperating with said wire feed means so that, upon interruption of wire feed from one of said wire supply means to one of said nozzles, said control circuit means cause transport of wire from the other supply means to and beyond the other of said nozzles to thus produce a continuous wire feed.

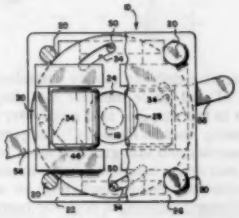
4,437,601
ADJUSTABLE WIRE GUIDE

Frank W. Brooks, Dayton, Ohio, assignor to Flexiblast Company, Wilmington, Del.

Filed Nov. 9, 1981, Ser. No. 319,823

Int. Cl.³ B65H *57/00*

U.S. Cl. 226—199 **5 Claims**



1. A wire guide means, comprising:

a frame;

at least two pairs of rollers, each pair being mounted in said frame such that rotational axes of said rollers are parallel to each other and in a plane perpendicular to an intended centerline location of a wire to pass between said rollers of said pairs, said pairs of rollers being disposed in different planes such that said axes of each of said pairs are positioned at spaced angular locations with respect to said axes of others of said pairs about said intended centerline location;

each of said rollers including a rigid support member and a pin projecting from said support member; and

a camming plate mounted perpendicular to and for rotation about said intended centerline location, said camming plate having a central opening through which a wire may pass and which is substantially concentric with said intended centerline location, and a plurality of arcuate slots at equal angular and radially spaced locations about said intended centerline location, each of said slots receiving a different one of said pins such that rotation of said camming plate causes equal inward or outward axial translational movement of said rollers with respect to said intended centerline location whereby said rollers may be positioned to engage a wire to position a centerline thereof coincident with said intended centerline location.

4,437,602
NAIL DRIVING TOOL

Jerome A. Kaczmarek, 9409 Grand Division Ave., Cleveland, Ohio 44125

Filed Aug. 4, 1978, Ser. No. 931,204

Int. Cl.³ B25C *1/02*

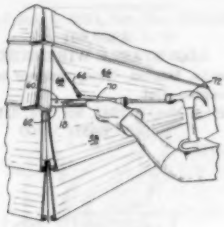
U.S. Cl. 227—147 **2 Claims**

1. A nail driving tool comprising:

(a) an elongated tubular guide member formed by a wall surrounding a nail receiving guideway, said guide member having a driving end forming an opening from which a

nail is driven and an opposite end, said guide member wall extending continuously about said opening and formed from a material which is transparent to electromagnetic radiation in the visible spectrum thus permitting a nail in said member to be observed from outside of the guide member, said guide member wall defining an internal nail guiding surface extending at least part way through said guideway from said opening toward said opposite end;

(b) an elongated driver member defining a rigid nail engaging surface at one end and a rigid anvil-like surface at its opposite end adapted to be struck with a hammer, said



driver member defining a body extending into said opposite end of said guide member and shaped to generally conform to the shape of said guideway; and,

(c) positioning means frictionally engaged between said driver member and said guide member for limiting movement of said driver member relative to said guide member, said positioning means including an elastomeric cup-shaped element defining a bore for receiving one end of the guide member and an aperture, said driver member extending through said aperture and frictionally engaging said cup-shaped element.

4,437,603

AUTOMATIC WIRING MACHINE FOR PRINTED CIRCUIT BOARDS

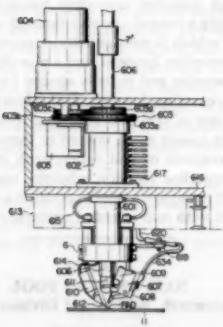
Mamoru Kobayashi, Hadano; Kanji Ishige, Kanagawa; Hideaki Sasaki; Mitsukiyo Tani, both of Hadano, and Yashuhiko Kawakami, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1980, Ser. No. 221,458

Claims priority, application Japan, Jan. 7, 1980, 55-130

Int. Cl.³ H05K *13/06*

U.S. Cl. 228—4.5 **6 Claims**



1. An automatic wiring machine for a printed circuit board comprising an X-Y table carrying the printed circuit board to be applied with wirings and movable in X and Y directions, and a head located above said X-Y table and rotatably supported by a main console of the machine to rotate about an axis perpendicular to the surface of said X-Y table, said head being mounted with a wire guide unit for guiding the feed of a wire for wiring to the surface of said printed circuit board, a bonding unit for bonding at a bonding point the wire fed from said wire guide unit to a conductor pattern on said printed circuit board by heating and depressing the fed wire, and a cutter unit for cutting away the wire at a site deviating from said bonding point to said wire guide unit, said wire guide, bonding and cutting units being mounted on said head for linear movement along lines which are inclined with respect to said axis, and the acting points of said wire guide, bonding and cutter units on the printed circuit board being substantially concentrated on said axis; further comprising a monitoring optical pipe for visual monitoring of the printed circuit board surface, said optical pipe passing along the rotation axis of said head.

4,437,604

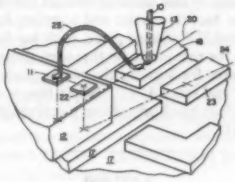
METHOD OF MAKING FINE WIRE INTERCONNECTIONS

Ely Razon, Hatboro, and Dan Vilenski, Horsham, both of Pa., assignors to Kulicke & Soffa Industries, Inc., Horsham, Pa.

Filed Mar. 15, 1982, Ser. No. 358,336

Int. Cl.³ B23K *20/10, 20/00*

U.S. Cl. 228—179 **4 Claims**



1. A method of making uniform fine wire interconnections between conductive pads on a semiconductor device and conductive terminals on a substrate employing a capillary type bonding tool comprising:

providing a fine wire in the capillary wedge bonding tool of the type having an annular working face with the end of the fine wire bent under the working face,

making a first wire bond to attach said bent end of said fine wire to a first conductive pad on said semiconductor,

moving said bonding tool away from said first conductive pad while paying out said fine wire to make a first fine wire loop interconnection between said first conductive pad and a first conductive terminal,

clamping said fine wire relative to said bonding tool,

making a second wire bond by attaching said fine wire to said first conductive terminal to provide a first fine wire interconnection between said conductive pad and said conductive terminal.

determining the angular direction of said first fine wire interconnection,

releasing said clamped fine wire,

moving said capillary wedge bonding tool a short vertical and horizontal distance from said second bond to pay out a bent end of fine wire under the working face of said capillary wedge bonding tool,

clamping said fine wire to prevent relative movement of said fine wire in said capillary bonding tool,

determining the angular direction between the next conductive pad on said semiconductor device and the next conductive terminal on said substrate to be interconnected by said fine wire, and wherein the included angle between said first wire interconnection and said second fine wire interconnection is between 15 degrees and 60 degrees, and

moving said capillary wedge bonding tool substantially horizontally away from said first and said second wire bonds along a path which is substantially equal to the determined angular direction between said next conduc-

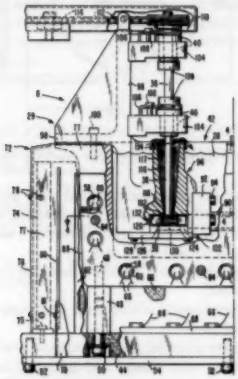
tive pad and said next conductive terminal on said substrate to be interconnected by said fine wire to provide the end of said fine wire bent under said capillary bonding tool oriented in a proper angle direction for the next first wire bond on said next conductive pad.

4,437,605

METHODS OF AND APPARATUS FOR PUMPING SOLDER

John G. Tucker, Lexington, and Hugh A. Wells, Winston-Salem, both of N.C., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,835
Int. Cl.³ H05K *3/34*
U.S. Cl. 228—180 R **12 Claims**



1. A method of pumping solder in a soldering operation, which comprises:

supporting a rotatable shaft for rotation solely in support means located above an upper surface of a molten solder bath such that the solder in the solder bath does not contact the support means;

suspending the rotatable shaft and an impeller on the shaft from the support means and into a container for holding the molten solder bath;

rotating the shaft and the impeller to pump solder in the molten solder bath to a molten solder discharge position; and

precluding the solder at the upper surface of the molten solder bath from making any significant contact with the rotating shaft as the solder is pumped to the molten solder discharge position.

4,437,606

BEVERAGE PACKAGE AND PRODUCTION BLANK WITH IMPROVED LOCKING FEATURES

Earl J. Graser, Monroe, La., assignor to Manville Service Corp., Denver, Colo.

Filed Mar. 26, 1982, Ser. No. 362,213
Int. Cl.³ B65D *5/02, 71/00*
U.S. Cl. 229—40 **4 Claims**

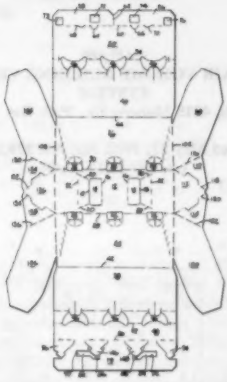
1. A wrap-around style beverage package for a plurality of cans or bottles of beverage, the package surrounding the cans or bottles and having locking means on overlapping first and second margins of the package, comprising:

(a) the first margin having a primary male adjustable locking portion comprising two oversized position tabs and two undersized position tabs; and

(i) the second margin having primary female adjustable locking portions engaged by the primary male adjustable locking portions of the first margin and comprising two oversized position slots positioned for engagement with the oversized position tabs on the first margin and two undersized position slots positioned for engagement with the undersized position tabs of the first margin;

(b) the second margin having secondary punch-style arrow-shaped male locking tabs; and

(i) the first margin having secondary punch-style, female locking openings engaged by the secondary punch-style male locking tabs; and;



(c) the first margin having tertiary punch-style, arrow-shaped male locking tabs on each side of the primary male adjustable locking portion; and

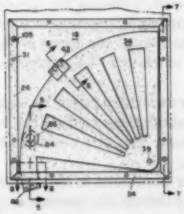
(i) the second margin having tertiary punch-style female locking openings on each side of the primary female adjustable locking portions engaged by the tertiary punch-style male locking tabs.

4,437,607

MAIL BOX SIGNAL

Edward Negosta, 4803 Old Branch Ave., Camp Springs, Md. 20031

Filed Jan. 8, 1981, Ser. No. 223,287
Int. Cl.³ B65D *91/00*
U.S. Cl. 232—35 **10 Claims**



1. A mail box having a door, bottom, and an end having a signal means;

a control means operative on said signal means responsive to door position;

the improvement comprising:

a first signal member (18) having a plurality of spaced signal areas;

a second signal member (36) having alternate concealing and revealing areas movable to alternately register with said spaced signal areas of said first member in respective relative concealing or revealing positions of said first and second signal members to conceal or reveal said signal

areas; said revealing areas of said second signal member being slots therethrough and said concealing areas comprising areas intermediate adjacent slots;

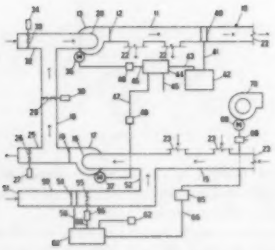
said signal members being of the same color except for color contrast of said spaced signal areas.

4,437,608

VARIABLE AIR VOLUME BUILDING VENTILATION SYSTEM

Robert B. Smith, 4915 Monona Dr., P.O. Box 6141, Madison, Wis. 53716

Filed May 17, 1982, Ser. No. 379,111
Int. Cl.³ F24F *13/04*
U.S. Cl. 236—13 9 Claims



1. A ventilation system for a building comprising:

(a) a supply duct;

(b) a return duct;

(c) a supply fan, having an inlet and an outlet connected to the supply duct, which is driven by an AC electric motor;

(d) a return fan, having an inlet and an outlet connected to the return duct, which is driven by an AC electric motor;

(e) a connecting duct extending from the outlet of the return fan to the inlet of the supply fan;

(f) means responsive to a condition indicative of the ventilation demands of the building for providing electrical power to the motors driving the supply and return fans at a frequency varying in response to the condition sensed in the building to change the speed of the fans in a manner which tends to restore the condition to a pre-selected value;

(g) an outside air duct extending from an intake communicating with the atmosphere outside the building to connection to the return duct at a position ahead of the inlet of the return fan;

(h) a flow sensor positioned in the outside air duct to sense the air velocity therein and provide an output signal indicative thereof;

(i) damper means in the outside air duct responsive to a control signal for controlling the resistence to flow therethrough and thereby controlling the velocity of air flow in the outside air duct;

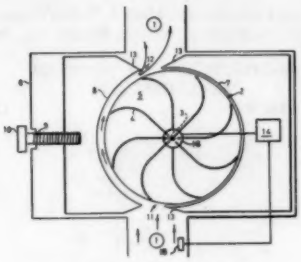
(j) outside air duct control means, receiving the output signal from the flow sensor and connected to provide a control signal to the damper means, for controlling the damper means in response to the rate of flow in the outside air duct to maintain a substantially constant flow velocity in the duct, whereby the flow rate through the outside air duct may be set to match the expected flow rate of air exhausted from the building being ventilated.

4,437,609

AUTOMATIC DAMPER DEVICE

Arne Johannson, Skövde, Sweden, assignor to Svensk Ideutveckling Handelsbolag, Skövde, Sweden

Filed Apr. 21, 1982, Ser. No. 370,162
Claims priority, application Sweden, May 15, 1981, 8103068
Int. Cl.³ F24F *13/10*
U.S. Cl. 236—49 6 Claims



1. An automatic damper device for use in a ventilation duct (1) comprising,

a paddle wheel (2) positioned in said duct and including a shaft (3) attached to said paddle wheel for attachment to said duct for free rotation relative thereto, said shaft being at right angles to said duct axis;

means (16) coupled to said paddle wheel for controlling the rotation thereof;

a sensor (15) positioned within said duct upstream of said paddle wheel; and,

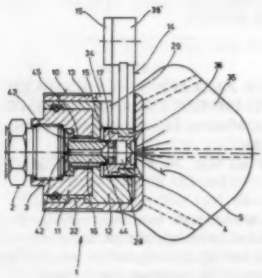
a thermostat (14) coupled to said sensor and said control means whereby said sensor and said thermostat actuate said control means, in response to changes in temperature in said duct.

4,437,610

REVERSIBLE QUICK CHANGE NOZZLE HOLDER FOR SPRAY GUNS

Willi Huber, and Manfred Metz, both of Altstätten, Switzerland, assignors to J. Wagner AG, Altstäten, Switzerland

Filed Dec. 4, 1981, Ser. No. 327,568
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046464
Int. Cl.³ B05B *15/02*
U.S. Cl. 239—119 27 Claims



1. A nozzle assembly for spray guns comprising a cylindrical base body assembly having an internally threaded bore for attachment to the outlet end of a spray gun, the base body assembly having an axial recess therein at an end opposite the threaded bore and open thereto, a nozzle mount received in said recess, a nozzle received in said nozzle mount, a cover nut

having an axial end wall with an outlet orifice therethrough, the outlet orifice having an opening larger than the maximum dimension of a spray stream from the nozzle when the cover nut is affixed to the base body assembly in operative position and said opening being less than the maximum dimension of the nozzle mount, the cover nut receivable on the base body assembly, a quick thread connection between the cover nut and base body assembly, the thread connection providing first and second rotational positions of the cover nut with respect to the base body assembly, the cover nut end wall enclamping the nozzle mount between the base body assembly and cover nut axial end when the cover nut is in the first position with respect to the base body assembly, the nozzle mount freely removable from the recess when the cover nut is in the second position with respect to the base body assembly, aligned radial openings on the base body assembly and cover nut communicating to said recess, a projection on said nozzle mount projecting through said openings and the opening on the cover nut having a circumferential dimension to allow rotation of the cover nut between the first and second positions without interference with the projection.

4,437,611

SELF PROTECTING SPRAY NOZZLE

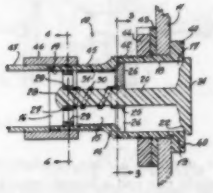
Alfred A. Gilroy, Richmond, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Continuation of Ser. No. 181,408, Aug. 26, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,817

Claims priority, application United Kingdom, Oct. 10, 1979, 7935179

Int. Cl.³ B05B *1/32, 12/12, 13/06*

U.S. Cl. 239—453 **4 Claims**



1. A spray nozzle for spraying a liquid inside of a conduit through which a corrosive or dirty fluid flows comprising a tubular body formed from heat resistant thermoplastic material with a central bore, an inlet at one end and an outlet orifice at the other end, a plunger formed from heat resistant thermoplastic material having a stem slidably mounted within the tubular body, the plunger having an enlarged head at one end of the stem located outside the tubular body and adjacent the outlet orifice so that the boundaries of the outlet orifice acts as a plunger seat, a bushing fixed within the tubular body to guide the plunger stem during its movement, an apertured disk fixed to the free end of the stem within the tubular body and slidable within the body, a sleeve positioned within the tubular body between the bushing and the disk, the sleeve limiting movement of the disk toward the bushing when opening the plunger to control the size of the outlet orifice opening in the nozzle, thermoplastic spring means including a coil spring made from a ribbon of polyester material loosely positioned about the stem between the bushing and the disk to normally bias the plunger stem in a direction toward the inlet to have the plunger head close the outlet orifice, the spring means capable of being overcome by water under pressure entering the inlet of the tubular body, and acting on the plunger head from within the tubular body to move the plunger head away from the tubular body to open the outlet orifice, and a mounting means on the nozzle for use in mounting the nozzle just inside a wall of the conduit so as to interrupt the flow of fluids therein as little as possible, said mounting means including a flange laterally projecting from the plunger seat which is located inside the wall and a threaded portion on the outer surface of the nozzle body adjacent the flange for receiving a nut which is located outside of the wall.

4,437,612

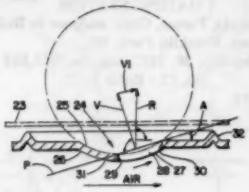
FLOTATION NOZZLE

Stephen Russ, Point Claire, and Don McAnespie, Montreal, both of Canada, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 28, 1981, Ser. No. 334,916

Int. Cl.³ B05B *1/14*

U.S. Cl. 239—556 **14 Claims**



1. A nozzle for impinging fluid against a web traveling adjacent thereto, comprising a housing having a wall which helps define a chamber through which fluid is circulated, under pressure, and a plurality of orifices disposed in the wall and communicating with the chamber and through which fluid passes from the chamber for impingement against the traveling web, and characterized by means for directing fluid from the plurality of orifices in a desired direction, including means for positioning the plurality of orifices so that the resultant vector (R) of vectors (V, V1) representing velocities due to static and dynamic fluid pressure at the orifices, is in said direction, and an annular ridge surrounding each of said orifices and projecting from the wall of the housing in a direction opposite the chamber.

4,437,613

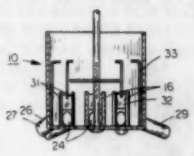
PARTICLE SPREADER APPARATUS

Floyd V. Olson, Rte. 2, Sherburn, Martin County, Minn. 56171

Filed Mar. 10, 1982, Ser. No. 356,886

Int. Cl.³ A01C *17/00*; A01F *25/18*

U.S. Cl. 239—688 **7 Claims**



1. A particle spreader apparatus for use in the equal distribution of particles, the apparatus comprising:

(a) particle holding means for receiving particles that are to be distributed;

(b) output means operably associated with said particle holding means for allowing particles in said particle holding means to exit therefrom;

(c) particle dispersal means for urging particles to exit from said particle holding means through said output means;

(d) dispersal guide means operably associated with said output means for supporting and guiding particles that have exited through said output means for a preselected distance from said output means before dispersing such particles;

(e) drain means operably associated with said particle holding means for allowing particles to exit from said particle holding means through said drain means when said particle dispersal means is not urging said particles to exit through said output means; and

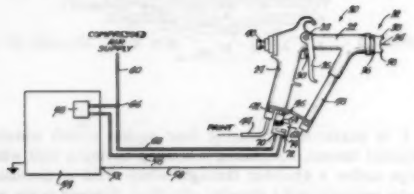
(f) deflection means for urging particles away from said drain means when said particle dispersal means is urging particles to exit through said output means.

4,437,614

ELECTROSTATIC AIR ATOMIZATION SPRAY COATING SYSTEM

Theodore Garcowski, Parma, Ohio, assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Sep. 28, 1982, Ser. No. 425,884
Int. Cl.³ B05B 5/02
U.S. Cl. 239—691 **8 Claims**



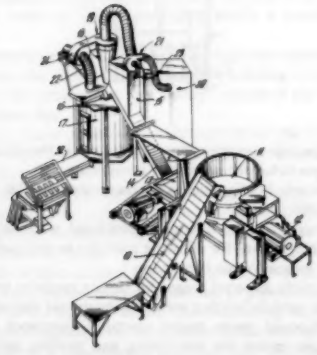
1. In an air atomization electrostatic spray coating system having a hand held spray gun, of the type wherein a flow of atomizing air to said gun is sensed by an air flow sensor for controlling energization of a high voltage power supply for a charging electrode on said gun, the arrangement being such that when the gun is triggered on and an air flow occurs the power supply is energized, and vice versa, the improvement comprising a bypass valve which is manually manipulatable to selectively bypass a flow of air to said gun around said air flow sensor to permit air atomization spraying with and without electrostatics.

4,437,615

PROCESS FOR PREPARING ANIMAL BEDDING

Patrick W. Whiteman, Reston, Va., assignor to Recycled Paper Bedding, Inc., Reston, Va.

Division of Ser. No. 291,482, Aug. 10, 1981, Pat. No. 4,378,756, which is a continuation of Ser. No. 74,238, Sep. 10, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 429,985
Int. Cl.³ B02C 18/286, 19/12
U.S. Cl. 241—24 **4 Claims**



1. A process for preparing animal bedding comprising subdivided newsprint consisting essentially of flat particles with irregularly shapes major surfaces of a maximum diameter not more than about three times the minimum diameter, said maximum diameter being less than about one-inch, said particles having a particle size distribution including at least about 15 wt. percent greater than one-quarter inch maximum diameter, at least about 40 wt. percent greater than 1/32 inch but less than one-quarter inch in maximum diameter and not more than about 30 wt. percent smaller than 1/32 inch in maximum diameter, which comprises

a. grinding the cellulosic material using a two-stage hammermill having screens in both stages containing a majority of smaller holes of about one-half inch diameter and a minority of larger, triangularly shaped holes approximating a triangle with sides of 1.3–1.7 inches, and

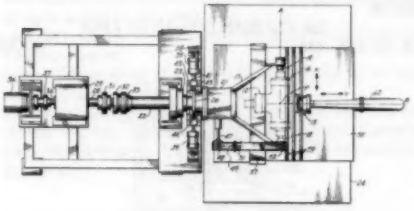
b. removing from the ground material sufficient dust and fine particles to reduce the percentage of product having a particle size below 1/32 inch to not more than about 30 wt. percent.

4,437,616

WINDING FIBER REINFORCED PIPE FITTINGS

Gerald M. Magarian, Cypress, and Ralph S. Friedrich, Hermosa Beach, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed Sep. 8, 1981, Ser. No. 300,292
Int. Cl.³ B65H 54/64, 81/08
U.S. Cl. 242—7.02 **53 Claims**



1. A method for winding a fiber reinforced plastic pipe fitting having a straight run and a lateral branch comprising:

holding a mandrel for the fitting so that the axis of the run passes through a point P;

positioning a delivery ring in an X-Y plane for translation in X and Y directions in the X-Y plane;

translating the delivery ring in the X-Y plane while alternately:

rotating the mandrel around an A axis through the point P and parallel to the X direction;

rotating the mandrel around a B axis through the point P and parallel to the X direction; and

delivering at least one fiber roving to the delivery ring; and

continually delivery at least one fiber roving from the delivery ring to the mandrel as the mandrel rotates alternately around the A and B axes.

4,437,617

WINDING APPARATUS FOR FILAMENTARY MATERIAL HAVING MEANS FOR WINDING A TRAILING END OF THE FILAMENTARY MATERIAL IN CLOSE ORDER UPON A PACKAGE

Max L. Cardell, Shelby, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

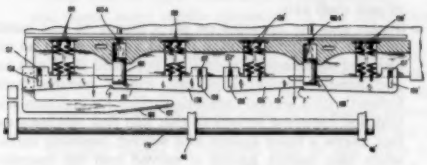
Continuation-in-part of Ser. No. 258,309, Apr. 28, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,911
Int. Cl.³ B65H 54/02, 54/22
U.S. Cl. 242—18 EW **12 Claims**

1. A winder for winding packages of filamentary material, comprising:

means for rotating a package about a longitudinal axis to wind-up filamentary material which is fed thereto,

traversing means for traversing the filamentary material along the package axis to produce a helical winding of the filamentary material, and

controlling means for engaging the filamentary material prior to the completion of a winding sequence to cause the trailing end of the filamentary material to be wound for a plurality of turns in non-helical, close-order relationship



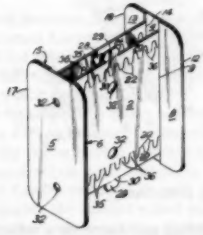
on the package to resist subsequent unraveling of the filamentary material, said controlling means comprising a movable arm including a contact edge oriented generally parallel to a plane defined by the traversing movement of the filamentary material, said arm being mounted for movement toward and away from such plane to contact the filamentary material and displace same out of said traversing means, said contact edge including a stop for constraining the filamentary material for winding in a non-helical, close-order relationship onto the package.

4,437,618

SPOOL DISPENSER

Daniel J. Boyle, Hartland, Wis., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 8, 1982, Ser. No. 396,164
Int. Cl.³ B65H *75/18, 75/14*
U.S. Cl. 242—71.8 **21 Claims**



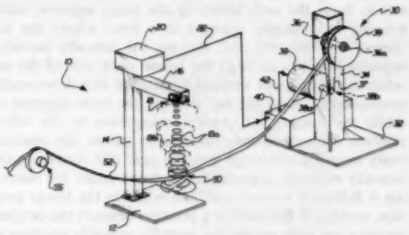
8. A spool dispenser comprising a front wall panel and a rear wall panel, a side flap extending from the outer edges of each front and rear wall panels and foldable relative thereto along a fold line and a side flap extending from each inner edge of the front and rear wall panels and foldable relative thereto along a fold line, a first side wall panel interposed between the inner side flaps extending from the front and rear wall panels and foldable relative thereto along a fold line, a second side wall panel extending from the outer side flap panel and foldable relative thereto along a fold line.

4,437,619

CATENARY CONTROLLER

Hall Cary, c/o 8074 Hubbard Valley Rd., Seville, Ohio 44273, and John F. Marquard, Strongsville, Ohio, assignors to Hall Cary, Seville, Ohio, a part interest

Filed May 6, 1981, Ser. No. 260,912
Int. Cl.³ B65H *23/20*
U.S. Cl. 242—75.51 **14 Claims**



1. Apparatus for maintaining a catenary-like section of traveling material suspended between a support point and a rotating reel collecting or dispensing the material comprising:

a stepping motor for rotatably driving the reel in discrete angular motions of generally uniform magnitude;

a multifrequency ultrasonic transducer positionable in spaced relation from the catenary-like section and operable in the pulse/echo mode to sense the position of the section, the transducer providing an output signal indicative of the section position relative to the transducer, the said output signal being derived in part from a reflected portion of a radiated interrogation pulse generated by the transducer, the interrogation pulse comprising a sequence of ultrasonic signals of different frequencies, at least a portion of one of said ultrasonic signals being reflected by the catenary-like section back to the transducer to constitute said reflected portion from which said output signal is derived; and

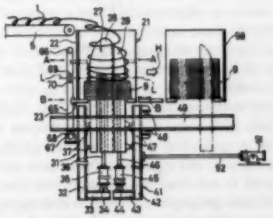
a control means responsive to the transducer output signal for regulating the frequency of discrete angular motions of the stepping motor driver reel to maintain the catenary-like section at a predetermined position relative to the transducer.

4,437,620

METHOD AND APPARATUS FOR GATHERING RINGS OR WIRE RODS INTO COILS

Masaichi Ozawa, Kimitsu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,420
Claims priority, application Japan, Apr. 13, 1981, 56-55223
Int. Cl.³ B21C *47/00*
U.S. Cl. 242—83 **7 Claims**



1. A method of gathering together rings of wire rod into a coil comprising:

dropping continuously supplied rings of wire rod from the delivery end of a conveyor around a sail in a gathering tub positioned beneath the delivery end of the conveyor and having a lateral side open, the sail having a vertically extending main segment movable only up and down in said tub and a laterally movable vertically extending segment movable from an original position adjacent the main segment both up and down and laterally while maintaining its vertical orientation; and

after a given quantity of rod rings has been gathered on the sail to form the coil, lowering the main segment while keeping it vertically oriented to a level where the top thereof is below the coil, moving the laterally movable segment laterally through the lateral open side of the tub while maintaining its vertical orientation to a down-ender positioned adjacent the sail, moving the main segment up while maintaining its vertical orientation to the initial position for immediately starting to gather the continuously supplied rod rings into the next coil, lowering the laterally movable segment in the down-ender for removing it from the formed coil, and while in the lower position, moving it laterally to a position beneath the original position and then raising the laterally movable segment to the original position to make up the complete sail again, all the while maintaining the laterally movable segment in its vertical orientation, and while continuing to gather falling rod rings into the next coil.

2. An apparatus for gathering together rings of wire rod into coils, which comprises:

a gathering tub adapted to be positioned beneath the delivery end of a rod-ring conveying means and having one lateral side open;

a sail in said tub for receiving the rod rings therearound, said sail having a vertically extending main segment movable only up and down in said tub, and a vertically extending laterally movable segment movable both up and down and laterally while maintaining its vertical orientation from a position adjacent said main segment to a position spaced away from said main segment through the laterally open side of said tub;

means connected to said main segment for moving said main segment only up and down; and

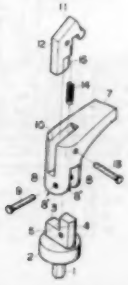
further means connected to said laterally movable segment for moving said laterally movable segment both up and down and laterally in both the raised and lowered positions of said laterally movable segment.

4,437,621

HANDLE FOLDING DEVICE FOR FISHING REEL

Akinori Sakumoto, Tokyo, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,812
Claims priority, application Japan, Jan. 27, 1981, 56-10449
Int. Cl.³ A01K *89/00*; G05G *1/00*
U.S. Cl. 242—84.1 J **4 Claims**



1. A trigger-actuated folding handle for fishing reel having a folded inoperative position and a non-folded operative position, comprising:

a reel shaft defining an axis of rotation:

a tenon formed on an end face of said shaft for rotation about said axis, said tenon including a notched step at its outer end including a first camming surface disposed generally parallel to said shaft axis;

a handle member including a groove, pivot means mounting said handle on said tenon for pivotal motion about a handle member axis disposed substantially normal to said tenon and said shaft axis, and further disposed to one side of said shaft axis;

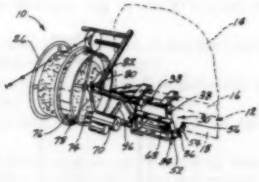
a trigger member mounted on pivot means on said handle member for pivotal motion in said groove about an axis disposed substantially normal to both said shaft axis and said handle member axis, said trigger member being formed with a second camming surface for coaction with said first camming surface so that said first camming surface exerts a force against said second camming surface when said folding handle is moved into the operative non-folded position, said trigger member being located substantially in a plane which includes said shaft axis in said non-folded position and having another surface positioned substantially opposite said first and second camming surfaces of said non-folded position, said handle member including surface means bearing against said another surface, for exerting a reactive force against said another surface when said folding handle is moved into said non-folded position to counteract said exerted force, the interaction of said first camming surface with said second camming surface and said another surface with said surface means causing said trigger member to be canted within said groove and firmly wedged between said tenon and said handle member, when said folding handle is moved into said non-folded position, thereby rendering said handle rigidly mounted on said tenon in said operative position.

4,437,622

WIRE ROLLER

Merle J. Heider, Humboldt, Iowa, assignor to Jet Co., Inc., Humboldt, Iowa

Filed Oct. 14, 1980, Ser. No. 196,657
Int. Cl.³ B65H *75/42*
U.S. Cl. 242—86.5 R **1 Claim**



1. A wire roller, comprising

a frame,

means for supporting said frame on a vehicle,

a wire receiving spool,

means for rotatably supporting said spool on said frame, and

power means for rotating said spool, said power means including an electric motor having an output shaft,

means for supporting said motor on said frame adjacent said spool, and

coacting drive means on said motor output shaft and spool, said coacting drive means being operative to rotate said spool in response to operation of said electric motor,

said means for supporting said frame on a vehicle including a

clamp assembly, comprising

an upper clamp jaw including a pair of upstanding laterally spaced apart upper leg members, means rigidly interconnecting said upper leg members, a pair of upper foot portions secured to and extended forwardly from upper portions of said upper leg members thereby to overlie the top of a vehicle bumper when said upper leg members are engaged against a rear wall of said bumper and a pair of depending flanges on the forward ends of said respective pair of upper foot portions for engagement with an upper front edge of said bumper,

said frame being rigidly connected to said upper clamp jaw,

a lower clamp jaw including an inverted generally U-shaped structure including a pair of generally upstanding lower leg members interconnected adjacent their upper ends and including a pair of forwardly extended lower foot portions at the lower ends thereof and upstanding flanges on forward ends of said lower foot portions for engagement with a lower front edge of said bumper,

means for pivotally connecting said leg members of said upper and lower clamp jaws together with said foot portions extending outwardly therefrom in vertically spaced apart relation for receiving a vehicle bumper therebetween, said means for pivotally connecting said leg members together comprising a plurality of vertically spaced apart holes in each of the upstanding upper leg members of the upper clamp jaw and a hole in each of the lower leg members of the lower clamp jaw registered with selected ones of the holes in the upper leg members and an elongated pivot pin inserted into and removably secured in said selected registered holes, said leg members thereby being constrained to relative pivotal movement about the longitudinal axis of said pivot pin and

torque application means comprising a screw means carried on the leg members of one of said clamp jaws and positioned for operative engagement with the leg members of the other clamp jaw thereby to pivot the lower leg members rearwardly and downwardly apart from the upper leg members and thereby urge the lower foot portions upwardly and rearwardly in clamping engagement on a vehicle bumper.

4,437,623

INTEGRATED WEBLOCKER WITH PROGRAM PAWL RETRACTOR

Manfred Wyder, Rowland Heights, Calif., assignor to American Safety Equipment Corporation, Troy, Mich.

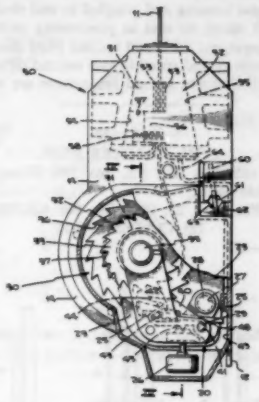
Filed Sep. 21, 1982, Ser. No. 420,713

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.2 **10 Claims**

1. In an inertia-responsive safety belt locking retractor for a vehicle having a frame mounted to the vehicle, a reel rotatably mounted on the frame having a safety belt webbing wound thereon for protraction and retraction, a multiple toothed ratchet wheel fixedly mounted to said reel, a locking pawl means for engaging the ratchet wheel to prevent protractive rotation of the reel and protraction of the safety belt webbing in an emergency, and a weblocker including clamping means mounted on the frame and having the safety belt webbing passing operably therethrough for selectively clamping the safety belt webbing against further movement relative to the clamping means, the improvement comprising the provision of an improved safety belt webbing protractive force sensing and weblocker actuating means comprising:

a rotatably mounted pawl assembly for carrying said pawl means and having limited rotational movement relative to the retractor frame between deactivated and activated positions, said pawl assembly rotating to the activated position when said locking pawl means is engaged with said ratchet wheel and protractive force is exerted on the safety belt webbing in excess of a predetermined threshold amount, and



a weblocker actuator for actuating said weblocker to directly clamp the safety belt webbing passing therethrough against further protraction in response to said pawl assembly rotating to the activated position.

4,437,624

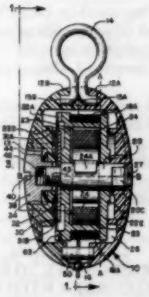
POSITIONING REEL

Irwin Rosenberg, Ann Arbor, Mich., assignor to Aero-Motive Mfg. Co., Kalamazoo, Mich.

Filed Feb. 1, 1982, Ser. No. 344,637

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107.3 **11 Claims**



1. A suspension positioning apparatus comprising: a housing; a non-rotating shaft variably positioned along the axis thereof within said housing; a spool rotationally mounted on said shaft and adapted to receive a suspension cord therein, said spool including at least one first engagable projection on a lateral surface thereof; first biasing means coupled to said spool for rotationally urging said spool in a first direction of rotation about said shaft, said first direction of rotation representing the direction of suspension cord take-up; a first disk rotationally positioned along said shaft and including a first surface in facing relation and in contact with the lateral surface of said spool, wherein said first surface includes at least one second engagable projection thereon for engaging said first projection when said spool rotates in a second direction representing the direction of suspension cord pay-out, and wherein said first disk is movable along the axis of said shaft in response to the displacement of said shaft; a second disk fixedly positioned in

said housing along said shaft and adapted to contact and frictionally engage a second surface of said first disk in inhibiting the rotation thereof; and adjustable control means positioned on a side of said housing and coupled to said shaft for displacing said shaft along its axis in positioning said first disk in selective engagement with said second fixed disk for controlling the rotation of said spool in said second direction of rotation when said first and second projections are engaged.

4,437,625

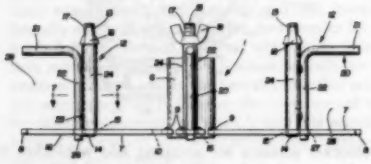
COIL ADAPTER REEL

Eugene R. VanSickle, Rte. #3, Box 190, Dover, Tuscarawas County, Ohio 44622

Filed Sep. 27, 1982, Ser. No. 424,380

Int. Cl.³ B65H *49/00*

U.S. Cl. 242—129 **6 Claims**



1. An improved reel construction of the type adapted to be mounted on the hub of a machine for holding and dispensing a coil of wire, said construction including:

(a) hub means for mounting the improved reel on a machine hub;

(b) a plurality of spaced, radially outwardly extending base plates mounted on the hub means;

(c) an upstanding post mounted on each of the base plates and extending generally parallel to the axis of the hub means;

(d) a locking hole formed in each of the base plates adjacent the post;

(e) arm means mounted on each of the posts for removably holding a coil of wire, each of said arm means including a sleeve telescopically movably mounted on a respective post, and an inverted L-shaped rod attached to said sleeve; and

(f) each of said rods having an outwardly extending portion spaced from and parallel with the base plates providing a coil receiving zone therebetween when the arm means is in a coil holding position, and a lower portion engageable in the base plate hole to secure the arm means in the coil holding position.

4,437,626

MECHANISM RESPONSIVE TO ROTATION STOPPAGE, AND TAPE RECORDER WITH SUCH MECHANISM

Ghislanus M. A. M. Aldenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 20, 1982, Ser. No. 340,906

Claims priority, application Netherlands, Feb. 16, 1981, 8100731

Int. Cl.³ B65H *59/38*; G03B *1/04*; G11B *15/32*

U.S. Cl. 242—186 **25 Claims**

1. A recording and/or playback apparatus comprising a drive system for transporting a recording medium, a component which rotates in response to transport of the medium, and a device for changing over the drive system upon stopping of rotation of the component, said device comprising

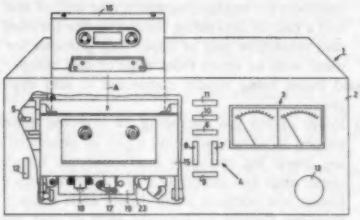
a lever having an actuating portion,

an actuating element frictionally coupled to said component and arranged to exert a torque on the lever when the component rotates,

means for imparting reciprocating movement to the lever during operation of the drive system, said lever and means arranged such that during said movement said portion follows a first path when said torque is exerted, and follows a second path in the absence of said torque, said

a switching element for changing over said drive, arranged to be actuated by reciprocating movement of said lever portion along said second path,

characterized in that said actuating element comprises at



least one cam arranged to engage said lever as a result of pivoting of the actuating element responsive to rotation of the component, said lever sliding along said cam during reciprocation, and

the device includes a guide element for guiding said lever portion along said first and second paths during reciprocation.

4,437,627

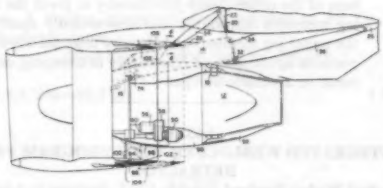
INTEGRATED POWER PLANT INSTALLATION SYSTEM

James R. Moorehead, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 12, 1982, Ser. No. 357,746

Int. Cl.³ B64D *27/18, 33/00*

U.S. Cl. 244—54 **12 Claims**



1. An underwing powerplant installation system comprising:

a powerplant;

strut means for securing said powerplant to the wing of said aircraft;

a plurality of aircraft wing bracket fittings including a first, forwardly extending fitting secured to a front wing spar, a pair of laterally spaced dependent fittings secured to said front wing spar, and a fourth dependent fitting secured to a rear wing spar;

first lug means including a pair of laterally spaced lugs secured to the upper rear edge portion of said strut means for aligned mating with said pair of laterally spaced dependent wing bracket fittings;

linkage means having one end thereof secured to the remainder of said plurality of aircraft wing bracket fittings; and

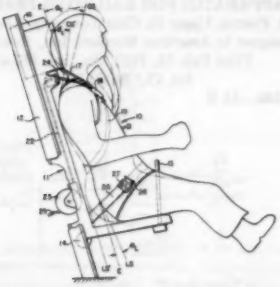
second lug means including a third lug secured to the upper surface of said strut means mid-way along the longitudinal extend thereof for engagement with a first one of said linkage means, and a fourth lug secured to the lower rear edge portion of said strut means for engagement with a second one of said linkage means.

4,437,628

POSITION AND RESTRAINT SYSTEM FOR AIRCREWMAN

Marcus Schwartz, Warminster, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1979, Ser. No. 53,465
Int. Cl.³ B64D *25/02, 25/06*
U.S. Cl. 244—122 AG 3 Claims



1. A system for positioning and restraining an aircrewman in an aircraft ejection seat catapulted by a thrust motor comprising, in combination:

a torso harness suit including lap belt means formed to be releasably connected at one end to the seat, and shoulder strap means;

retracting means formed to be secured to the seat including restraint strap means releasably connected at the outer ends to said shoulder strap means;

inflatable vest means formed to be worn by the aircrewman and positioned beneath the front and shoulder portions of said suit adjacent to said lap belt means and said shoulder strap means for forcing upper and lower torso of the aircrewman against the back of the seat; and

control means operable by the aircrewman for emergency escape including first actuator means connected to said retracting means for concomittantly retracting said restraint strap means and inflating said vest means, and second actuator means formed to be connected to the thrust motor for initiating ejection a predetermine time after operation of said first actuating means;

whereby the aircrewman's spinal column is positioned as near as possible along the direction of seat ejection.

4,437,629

SEAT STRUCTURE HAVING AN ADJUSTABLE SEAT BACK AND SUPPORT SHELF ESPECIALLY FOR ACCOMMODATING PARACHUTE PACKS

Martin W. Roine, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

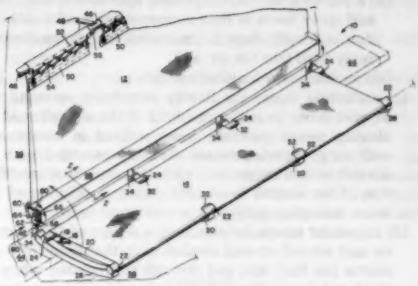
Filed Aug. 9, 1982, Ser. No. 406,520
Int. Cl.³ B64D *11/06*
U.S. Cl. 244—122 R 15 Claims

1. Seat structure, comprising:

a seat bottom portion;

a seat back portion; and

means movable between first and second positions, and operatively connected to said seat back portion along the lower edge portion of said seat back portion, for serving as a support platform projecting forwardly of said seat back portion when said means is disposed in said first position and said seat back portion is disposed in its seat back mode, and disappearing behind said seat back portion



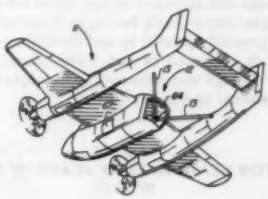
when said means is disposed in said second position and said seat back portion is disposed in its seat back mode.

4,437,630

SPRAY BOOM APPARATUS FOR APPLYING CHEMICAL DISPERSANTS TO OCEAN OIL SPILLS

James C. Jefferies, Chandler, Ariz., assignor to Biegert Aviation, Inc., Chandler, Ariz.

Filed Sep. 8, 1981, Ser. No. 300,260
Int. Cl.³ B64D *1/18*
U.S. Cl. 244—136 1 Claim



1. In combination with a transport aircraft, said aircraft including

a fuselage having an exterior aerodynamic surface,

wings attached to the fuselage,

a hold formed within the fuselage for receiving and carrying cargo during flight of said aircraft, and

an entranceway formed in the fuselage for loading and unloading cargo into and from the hold,

boom and nozzle spray apparatus for in-flight adaptation of the aircraft for aerial swath spraying, said boom and nozzle apparatus generally

permitting said aircraft to be modified for aerial spraying by extending a spray boom while in flight over a designated spraying area so that aerodynamic drag which would be caused by having the boom extended during flight to and from the designated spraying area is eliminated,

eliminating having to structurally modify the aircraft during installation of said boom and nozzle apparatus,

being quickly and conveniently installed in said cargo hold so the aircraft can be rapidly fitted with said apparatus and take flight,

being readily removed from the aircraft after installation therein and installed in a second transport aircraft, and

reducing corrosion of the wings and fuselage of the aircraft which occurs when corrosive chemicals are dispensed by said apparatus,

and including

(a) a support frame,

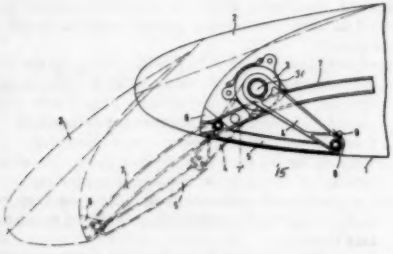
(b) an elongate substantially rigid spray boom carried by said support frame and having
(i) a fluid conduit,
(ii) a plurality of fluid dispensing apertures spaced along said spray boom in fluid communication with said conduit and each shaped, contoured and dimensioned to spray fluid into the air, and
(iii) an imaginary longitudinal axis,
(c) anchoring means for fixedly detachably securing said support frame in said cargo hold of the aircraft, said anchoring means generally being utilized in combination with cargo securing means normally provided with the aircraft in said cargo hold such that structural modification of the aircraft is avoided during installation of said boom and spray apparatus in said cargo hold,
(d) connector means for attaching a source of fluid carried on said aircraft to said conduit such that fluid from said source can flow into and through said conduit when desired and be discharged through said apertures in said spray boom,
(e) means carried by said frame for moving said spray boom between at least two operative positions after said frame anchoring means has been utilized in combination with said cargo securing means to make fast said frame in said cargo hold,
(i) a first operative position with said boom stored in said cargo hold, and
(ii) a second operative position with said boom positioned outside of and spaced away and laterally from said fuselage with said imaginary longitudinal axis of said boom at an angle with respect to the direction of travel of the aircraft when airborne such that spray dispensed through said apertures of said boom forms a generally elongate planar swath having an imaginary longitudinal axis generally parallel to said direction of travel of the aircraft, a portion of said frame extending from said hold through said entranceway to support said boom in said second operative position.

4,437,631

DRIVE FOR LEADING EDGE FLAPS OF AIRCRAFT WINGS

Wilhelm Martens, Delmenhorst, and Homayoun Dilmaghani, Gessel, both of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke Fokker GmbH, Bremen, Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 141,008
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916040
Int. Cl.³ B64C *3/50*
U.S. Cl. 244—214 **2 Claims**



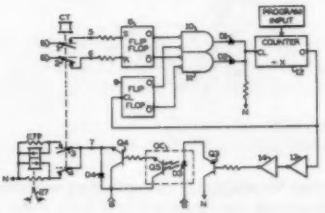
1. In a wing for an aircraft and having one or more leading edge slats, there being a common drive shaft for the slats, a drive and actuating mechanism comprising:
gear means, drivingly connected to the drive shaft;
a crank arm connected to be driven by the gear means;
a thrust rod linked with one end directly to the crank arm, the other end of the thrust rod being pivotally linked directly to the slat;
cover means on the thrust rod extending for its length and completing the wing surface when the slat is held in a retracted position;
an arc-shaped guide rail connected to the slat; and
a guide means running in engaging relation with the rail and being connected to the wing.

4,437,632

RESET APPARATUS FOR RAILROAD TRACK CIRCUITS

Robert D. Pascoe, Upper St. Clair Township, Allegheny County, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Feb. 25, 1982, Ser. No. 352,424
Int. Cl.³ B61L *21/00*
U.S. Cl. 246—34 R **8 Claims**



1. In a track circuit for a railroad track section, including an alternating current energy source coupled to the rails at one end of said section for normally supplying steady energy through said rails, a track relay connected to said rails at the other end of said section and responsive only to steady energy received through said rails for registering an unoccupied section, and a code transmitter means controlled by said track relay to be activated when a train occupies said section, reset apparatus comprising,
(a) a counting means operable for counting successive input clock pulses and responsive to a preselected total count for generating an output pulse of clock pulse duration and resetting to initiate a new count,
(b) a first switching means coupled to said counting means and operable for alternately producing continuous first or second gating signals in response to reception of successive output pulses from said counting means,
(c) a first and a second gate means controlled by said first switching means to be alternately enabled by said first and second gating signals, respectively,
(d) each gate means coupled for alternately receiving code pulses a the code rate of said code transmitter means, when active, and operable when enabled for applying corresponding clock pulses successively to said counting means,
(e) a repeater relay having two control windings and operable alternately between first and second positions only as said windings are alternately energized, and
(f) driver circuit means controlled by said counting means and coupled by said code transmitter means when active for normally alternately energizing said repeater relay windings and responsive to the reception of an output pulse from said counting means for inhibiting the energization of the repeater relay winding then coupled by said code transmitter means to hold said repeater relay in its existing position during that and the next subsequent clock pulse periods,
(g) said repeater relay further coupled when a train occupies said section for coding the energy supplied by said source to said section rails, said coded energy being periodically modified at the end of each preselected total count by a lengthened energy pulse to which said track relay re-

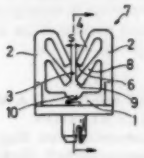
sponds when said section is unoccupied to restore the supply of steady energy to said rails.

4,437,633

ELASTIC FASTENING CLAMP FOR ROUND BARS OR CABLES OF VARIOUS DIAMETERS

Guy Andre, Seyssinet-Pariset, France, assignor to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,190
Int. Cl.³ F16L 3/22
U.S. Cl. 248—68 R 4 Claims



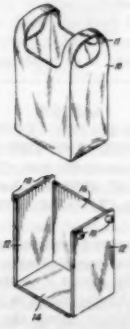
1. An elastic fastening clamp operable to secure round bars of various diameters onto a support plate, comprising two side walls joined together in U-shaped manner by a bottom plate, said side walls being provided at their free ends with a flexible holding tongue integral therewith and angled downwardly therefrom towards the center of a fastening space formed by the bottom plate and side walls, said tongues each being formed with a holding rim at the lower end thereof, each of said side walls being provided with a flexible support wall angled downwardly from the upper area of the side walls, said support walls having lower rims terminating approximately centrally between the holding rims of the tongues and the bottom plate, the adjacent holding rims of the tongues and the adjacent lower rims of the support walls being normally spaced apart from one another and defining a gap at the center of the holding space, said bottom plate having a relatively flat upper surface and provided with a groove at the center thereof parallel to the side walls, said groove being substantially less in width than the spacing between the side walls and wider than said gap and operable to laterally support a plurality of different sized round bars to be held in place in said clamp.

4,437,634

PLASTIC SACK HOLDER

Thomas P. Hambleton, Pine Bush, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 296,945
Int. Cl.³ A63B 55/04
U.S. Cl. 248—97 22 Claims



1. A device to hold open for loading a limp plastic sack having a pair of integral handles and a body portion terminating in a base portion, said device comprising:

(a) a base member;

(b) a pair of side wall members attached at their lower ends to said base member;

(c) a rear wall member attached to each of said side wall members;

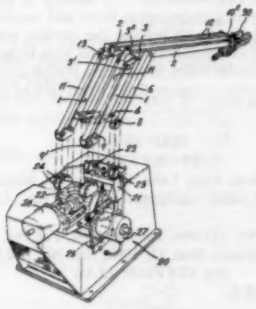
(d) means to engage the handles of said plastic sack, said means comprising a pair of spaced apart knob-like protuberances attached to the outer side and near the upper edge of each of said side wall members; wherein the height of said side wall members is slightly less than the height of the plastic sack to be loaded therein and wherein the internal perimeter of said base member is at least equal to the perimeter of the base of said plastic sack when said sack is in an open position and ready for loading.

4,437,635

PANTOGRAPH LINKAGE SYSTEM

Duc T. Pham, Birmingham, England, assignor to National Research Development Corporation, London, England

Filed Jan. 25, 1982, Ser. No. 342,426
Claims priority, application United Kingdom, Jan. 26, 1981, 8102311
Int. Cl.³ F16L 3/00
U.S. Cl. 248—122 4 Claims



1. A manipulator comprising a pair of pantographs interconnected to serve as opposed links of a parallelogram linkage, the pantographs in turn having first and second arms each operative as a parallelogram linkage, means for maintaining interconnections of the parallelogram linkages in fixed relative relationships and means for imparting linear input movement in all three dimensions to the pantographs whereby three dimensional movement of a tool or the like suitably secured to the pantographs may be occasioned whilst maintaining its spatial orientation constant.

4,437,636

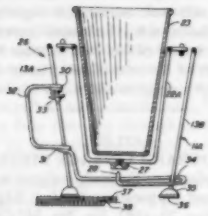
SELF-ORIENTATING FLUID CONTAINER DEVICE

Anthony Mazzurco, 7 Elsmere Pl., East Northport, N.Y. 11731, and Richard L. Miller, Dix Hills, N.Y., assignors to Anthony Mazzurco, East Northport, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,219
Int. Cl.³ A47F 5/12
U.S. Cl. 248—137 4 Claims

1. A self-orienting fluid container device, comprising in combination, a stationary base having an outer support ring, support legs depending from said outer support ring and a 1st pair of diametrically opposed notches formed in said outer support ring; an outer gimbal frame having an outer gimbal ring with a 1st pair of radially outwardly extending diametrically opposed spurs which pivotally seat in said 1st pair of opposed notches, and a second pair of diametrically opposed

notches formed in said outer gimbal ring spaced 90 degrees from said 1st pair of spurs; an inner gimbal frame having an inner gimbal ring with a second pair of radially outwardly extending diametrically opposed spurs which pivotally seat in said second pair of opposed notches, and a depending basket for removably supporting a fluid container; and a selective locking mechanism for automatically retaining the fluid container in a fixed orientation when grabbed for drinking, comprising an inverted receptacle positioned on the bottom of said basket, a handle slidably coupled to a support leg for lifting the



device to raise the fluid container for drinking, an arm extending from said handle, and an upwardly extending prong at the end of said arm, said prong engaging said receptacle with the lifting of the handle to prevent rotation of the container with respect to the device whenever it is desired to lift the container, and said prong disengaging from said receptacle upon lowering of said handle to replace the device, whereby the device will pivot in mutually orthogonal axes to maintain the container in a vertical orientation when placed down and the device will keep the container fixed when picked up.

4,437,637

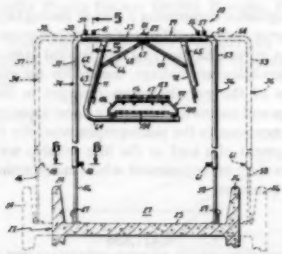
SUPPORT STAND

Floyd E. Buschbom, Long Lake, and Glen D. Hansen, Maple Plain, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

Division of Ser. No. 115,608, Jan. 28, 1980, Pat. No. 4,320,825. This application Dec. 11, 1980, Ser. No. 215,318

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—163 A **7 Claims**



1. A stand for supporting an object above a location comprising: cross means extended generally horizontal across the object, said cross means having opposite end portions, each end portion having a passage, first leg means connected to said cross means, said first leg means having a first member extended into the passage in one end portion of the cross means, first lock means mounted on the cross means engageable with said first member to hold the first leg means in an adjusted position relative to the cross means, second leg means connected to said cross means, said second leg means having a second member extended in the passage in the other end portion of the cross means, second lock means mounted on the cross means engageable with said second member to hold the second leg means in an adjusted position relative to the cross means, said first and second lock means being releasable whereby the width of the stand can be adjusted, each of said first and second leg means being adapted to engage a support in the location, and arm means connected to the cross means adapted to be attached to the object to hold the object above the location, said arm means having a downwardly and outwardly directed first portion connected to one end portion of the cross means, and a generally horizontal second portion connected to the first portion, said second portion located below and extended generally parallel to the cross means, said first and second portions of the arm means being fixed in an upright plane extended along the length of the cross means, and means on the second portion to support an object between the cross means and second portion of the arm means.

4,437,638

ARRANGEMENT FOR FASTENING A MONITOR TO A TEXT STATION

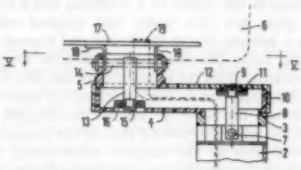
Konrad Scheibenpflug, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,242

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014478

Int. Cl.³ B01D *27/02*

U.S. Cl. 248—282 **8 Claims**



1. Apparatus for fastening a screen monitor to a text printing machine having a housing, comprising an upright column positioned to one side of said machine housing, an extension arm extending laterally outward from the longitudinal axis of said column, a first bushing connecting means between one end of said extension arm and an upper end of said column such that said extension arm is swivelably disposed relative to said column, a second bushing connection means between the other end of said extension arm and said screen monitor such that said screen is mounted for swivelable movement relative to said extension arm other end, wherein said first bushing means comprises a bush disposed on said column, a pin shaft extending through said bush and securing said bush to said column, a pin connected at one end to said pin shaft and extending upward therefrom, a connector surface portion formed on said extension arm disposed over said bush, and a shoulder screw for clamping said connector surface portion onto said bush and being threadably received in an upper end of said pin.

4,437,639

SELF-ADJUSTING SELF-LOCKING HANGER FOR PICTURES AND THE LIKE

Alvin W. Stein, 2237 Losantiville Ave., Cincinnati, Ohio 45237

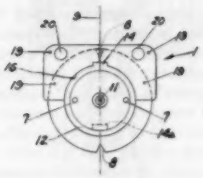
Filed May 10, 1982, Ser. No. 376,377

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—558 **9 Claims**

1. A self-adjusting hanger for mounting pictures and the like to a vertical wall surface comprising a wall mount member having means to fixedly mount it to the wall surface and a picture mount member having means to fixedly mount it to the rear surface of the picture along the vertical center line thereof, each of said members having cooperating arcuate surfaces by which one of the members may pivotally rest on

the other member and rotate with respect thereto to allow the picture to hang straight, said wall mount member including a mounting plate and circular rim forming one of said arcuate surfaces extending outwardly from one major surface of said plate, said rim being configured to abut the wall surface to space said plate therefrom, said picture mount member including a semi-circular cut-out forming said other surface, said rim mating within said cut-out, portion of said rim forming a key



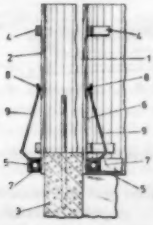
portion, said cut-out including a notch dimensioned to mate with said key portion to prevent relative rotation between said members, said mounting means further including means for attaching the wall mount member in first orientation where said key portion engages said notch to prevent relative rotation between said members and a second orientation wherein said key portion and said notch are unmated to permit relative rotational movement between said members.

4,437,640

BRACING UNIT FOR CONCRETE FORMWORK

Otto Heinzle, Götzis, Austria, assignor to Schalungsverleih Heinzle AG Attstatten CH-9450, Switzerland

Filed Nov. 17, 1981, Ser. No. 322,087
Claims priority, application Austria, Nov. 25, 1980, 5759/80
Int. Cl.³ B29H 5/02
U.S. Cl. 249—20 **6 Claims**



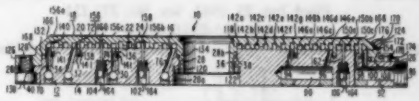
1. A bracing unit for securing formwork sections to a falsework structure supporting the formwork or to a previously poured section of a concrete structure, comprising a pressurized fluid inflatable and expandable hose positionable against the outside surface of the formwork section and a rigid abutment member supporting said hose and for securing said hose against the outside surface of the formwork structure whereby said hose and rigid abutment member are placed against the formwork sections with said hose in the deflated condition and then said hose is inflated and expanded for applying a uniform contact pressure against the formwork sections and pressing the formwork sections against the falsework structure or the previously poured section.

4,437,641

MOLD FOR RECORDED DISC

David Stavitsky, Plainsboro, and Ernest A. Beres, Robbinsville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 418,809
Int. Cl.³ B29D 17/00
U.S. Cl. 249—79 **23 Claims**



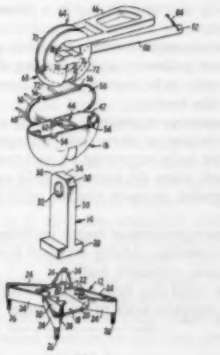
1. A mold for molding a recorded disc comprising:
a base plate having inner and outer surfaces,
a cap plate having inner and outer surfaces mounted on the base plate with the inner surface of said cap plate in opposed mating relation with the inner surface of the base plate, said cap plate having a mold cavity in its outer surface, and a plurality of separate sets of interconnected grooves in its inner surface, and
means in said base plate for providing a flow of temperature control medium to each of said sets of grooves including separate inlet and outlet passages to each set of grooves.

4,437,642

LIFT SYSTEM FOR TILT-UP WALLS

Neil L. Holt, Foster City, Calif., assignor to The Burke Company, San Mateo, Calif.

Division of Ser. No. 199,944, Oct. 23, 1980, Pat. No. 4,367,892.
This application Mar. 1, 1982, Ser. No. 353,575
Int. Cl.³ B28B 7/28
U.S. Cl. 249—175 **2 Claims**



1. An apparatus for forming a recess about the upper end of an anchor embedded in a concrete slab, said apparatus comprising: a body shell of hollow configuration, said shell having a smooth convex side and an open concave side opposite said convex side; a receptacle formed in said body and opening through the convex side thereof, said receptacle extending inwardly into a mid-portion of the open concave side whereby voids are provided in said shell to either side of said receptacle, said receptacle being complemental in shape to the upper end of the anchor for receipt of the anchor and frictional engagement therewith, said receptacle having a distal end with shoulders adapted to be seated on the upper end of an anchor received therein and an opening affording visual access to the interior thereof to determined whether or not an anchor received therein is seated; and, a top engaged with the body shell to close the open concave side thereof, said top being releas-

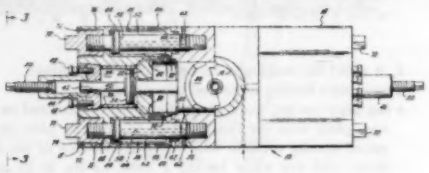
able from the shell to afford access to the opening in the receptacle and the voids to either side of the receptacle.

4,437,643

RAM-TYPE BLOWOUT PREVENTER

William L. Brakhage, Jr., and William M. Taylor, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 25, 1981, Ser. No. 277,231
Int. Cl.³ E21B *33/06*
U.S. Cl. 251—1 A **5 Claims**



1. A blowout preventer comprising
a body having a bore extending therethrough and aligned opposed ram guideways extending outwardly from said bore through said body,
a pair of bonnets positioned on opposite sides of said body in covering relationship to the outer openings of said ram guideways,
each bonnet having a central cylinder therein, a pair of side cylinders and a pair of openings at each end of said side cylinders, said side cylinders and openings extending through the bonnet in parallel relationship to said central cylinder, said central cylinder being axially aligned with its guideway,
a ram in each of said guideways,
a rod connected to each ram and extending through the ram guideway and terminating in a piston within the bonnet cylinder,
a pair of studs secured within the body spaced to the sides of each ram guideway and extending therefrom in parallel relationship to be received in the openings and side cylinders in the bonnet,
means responsive to pressure coacting with said studs in said side cylinders to move said bonnets toward and away from said body supported on said studs and to pretension said studs when the bonnet is held against said body,
a nut threaded on each stud to secure the bonnets to the body,
said pressure responsive means including
a flange extending radially outward from each of said studs in said side cylinders, and
means for suppiying fluid under pressure to said side cylinders at opposite sides of said flange.

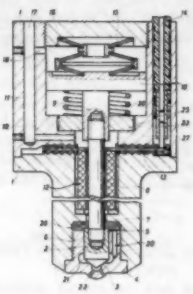
4,437,644

ELECTRICALLY OPERABLE VALVE

Gottlieb Wilmers, Neuenstadt, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1980, Ser. No. 173,406
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1979, 2931874
Int. Cl.³ F16K *31/04*
U.S. Cl. 251—11 **3 Claims**

1. An electrically operable valve comprising:
a housing having a damper chamber, a fluid inlet, a fluid outlet with a valve seat and a fluid path therebetween;
a movable valve body arranged for cooperation with said valve seat,
a damper piston slidable within said damper chamber,
a rod for connecting said valve body to said damper piston, the movement of said rod being damped by said damper piston, said rod being of the magnetostrictional type which changes its longitudinal dimension when an electromagnetic field is applied to it for lifting said valve body



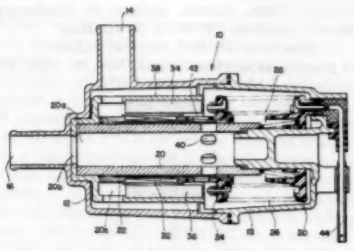
off said valve seat; a spring means for urging the valve body against the valve seat; and
a coil for applying said electromagnetic field to said device.

4,437,645

ELECTRICALLY DRIVEN FLOW CONTROL VALVE ASSEMBLY

Isshi Nomura, Aichi, and Motonobu Akagi, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 18, 1982, Ser. No. 349,976
Claims priority, application Japan, Feb. 20, 1981, 56-24769; Feb. 20, 1981, 56-24770
Int. Cl.³ F16K *31/08*
U.S. Cl. 251—65 **2 Claims**



1. An electrically driven flow control valve assembly with comprises:
a body having an inlet port and an outlet port;
a hollow iron core, disposed coaxially within said body, having at least one communicating hole for communicating said inlet and outlet ports through the interior of said iron core;
a slide valve disposed on the outside of said iron core for sliding movement axially therealong, said slide valve having an electromagnetic coil wound thereon, and including at least one valve hole which overlaps said communicating hole to control the effective opening degree of said communicating hole as the slide valve slides for regulating the degree of communication between said inlet and outlet ports;
a pair of permanent magnets so arranged that the magnetic flux produced thereby passes through the windings of said electromagnetic coil at a right angle;
a ferromagnetic member for forming a magnetic circuit for

the magnetic flux produced by said permanent magnets; and

a pair of springs for biasing said slide valve and for delivering an energizing current to said electromagnetic coil;

said slide valve being retained at a predetermined position by said springs when said electromagnetic coil is in the de-energized state, and being driven slidably along said iron core against the force of said springs in response to energization of said electromagnetic coil by the energizing current;

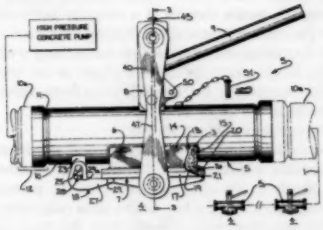
said valve hole being so formed in said slide valve as to deliver a predetermined initial flow quantity through the effective opening of said communication hole when said slide valve is retained at said predetermined position with said electromagnetic coil in the de-energized state, and to temporarily increase and then decrease the flow quantity through the effective opening of said communication hole as said slide valve is driven slidably along said iron core with an increase in the energizing current following excitation of said electromagnetic coil.

4,437,646

DISCHARGE VALVE FOR CONCRETE PUMPING APPARATUS

David E. Bigelow, Milwaukee, and Terry Timmerman, Grafton, both of Wis., assignors to Construction Forms, Inc., Cedarburg, Wis.

Filed Nov. 2, 1981, Ser. No. 317,245
Int. Cl.³ F16K 51/06; G05G 1/04
U.S. Cl. 251—145 **12 Claims**



1. A valve apparatus adapted to be connected in a concrete pumping system comprising a tubular valve body having opposite ends adapted to be releasably secured in fluid tight connection within a high pressure pumping line, said valve body having a discharge opening in one side thereof, said discharge opening have a rectangular shape including a longitudinal length greater than the circumferential length,

a valve pipe secured to said opening and having a corresponding rectangular cross section corresponding to said opening and forming an extension of said opening, said valve pipe having an outer substantially planar sealing end surface,

a valve closure plate means having a substantially flat sealing surface adapted to abut said planar sealing end surface to seal said pipe,

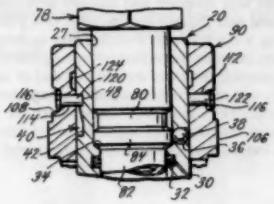
a linkage means connected to said valve closure means and said valve body and including an operating member pivotally mounted for moving said valve closure means between a first closed position abutting said planar sealing end surface and a second open position spaced from the plane of the sealing end surface to fully open said discharge opening.

4,437,647

QUICK CONNECT-DISCONNECT COUPLING FOR FLUID LINES

Lee H. Cruse, Ozark, Mo., assignor to Foster Manufacturing Company, Springfield, Mo.

Continuation-in-part of Ser. No. 104,307, Dec. 17, 1982, abandoned. This application Jun. 7, 1982, Ser. No. 385,858
Int. Cl.³ C11D 7/00
U.S. Cl. 251—149.9 **47 Claims**



1. A connect-disconnect coupling which comprises a female member, a sleeve which encircles said female member, said female member and said sleeve being relatively movable, a plug which is dimensioned to telescope into one end of said female member, locking means on said female member and complementary locking means on said plug that selectively respond to telescoping movement of said plug into said one end of said female member and to relative movement of said sleeve and female member into plug-locking position to lock said plug in position within said one end of said female member and that respond to relative movement of said sleeve and female member to plug-unlocked position to release said plug for movement away from said female member, and interacting means on said sleeve and on said female member which require relative movement of said sleeve and said female member in a progressive but not necessarily continuous direction of movement between said plug-unlocked position and at least one of two predetermined plug-locked positions to cause said locking means on said female member to coact with said complementary locking means on said plug to lock said plug in position within said one end of said female member, said interacting means requiring relative movement in said progressive but not necessarily continuous direction of movement to occur in a predetermined sequence from said plug-unlocked position to a first predetermined plug-locked position and then to a further predetermined plug-locked position whenever said relative movement is to be from said plug-unlocked position to and through said two predetermined plug-locked positions and then back to said plug-unlocked position, said interacting means preventing accidental relative movement of said sleeve and said female member in the return direction of movement between said further predetermined plug-locked position and either said plug-unlocked position or said first predetermined plug-locked position.

4,437,648

BELT TENSIONING TOOL

E. R. Thorn, Farmington Hills, and Brent Thorn, Northville, both of Mich., assignors to Van F. Belknap Co., Wixom, Mich.

Filed May 28, 1981, Ser. No. 267,837
Int. Cl.³ B66F 3/24
U.S. Cl. 254—93 R **1 Claim**

1. An endless belt tensioning tool for tensioning an endless belt that passes around a plurality of spaced apart pulley means with one of said pulley means being mounted for adjustable movement relative to the other pulley means, said belt tensioning tool comprising:

an actuator assembly including an extensible rod means;

a reaction assembly mounted to one end of said actuator assembly, said reaction asembly including a first adapter

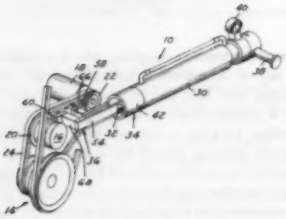
member which is engageable with one of said pulley means;

a slidable assembly mounted to said extensible rod means, said slidable assembly including a second adapter member which is engageable with another of said pulley means;

said first adapter member being releasably mounted on a reaction arm member and said second adapter member being releasably mounted on a slidable arm member, and said adapter members including pulley engaging ends which extend in opposite directions;

said reaction arm member and slidable arm member being parallel and said slidable arm member being slidably movable along a track in said reaction arm member;

said reaction assembly including an open generally cylindrical hub member mounted to said one end of said actuator assembly, said reaction arm member being mounted to the outer periphery of said hub member with the longtudinal axis of said reaction arm member being laterally offset from the longtudinal axis of said extensible rod means, said



reaction arm member extending in a cantilevered fashion away from said hub member and said one end of said actuator asssembly, said slidable assembly including a mounting block mounted to said extensible rod means, said slidable arm member being mounted to the periphery of said mounting block with the longitudinal axis of said slidable arm member also being laterally offset from the longitudinal axis of said extensible rod means, said slidable arm member extending in a cantilevered fashion away from the mounting block and said one end of said actuator assembly and slidably engaging the track in said reaction arm member, and said mounting block being positioned within said open hub member when said rod means is fully retracted; and

said second adapter member being movable relative to said first adapter member in response to extension of said rod means for thereby causing selective movement of said adjustably mounted pulley means and tensioning of said belt.

4,437,649

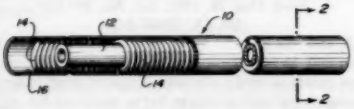
EXOTHERMIC CUTTING ELECTRODE

Perry J. Rieppel, Worthington, and Paul E. Moore, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

Continuation-in-part of Ser. No. 274,118, Jun. 26, 1981, Pat. No. 4,391,209. This application Apr. 27, 1983, Ser. No. 488,917

Int. Cl.³ B23K *35/02*

U.S. Cl. 266—48 **5 Claims**



1. In an exothermic cutting electrode of the type comprising an inner tube around which is wrapped a continuous length of wire in a helical fashion covered by an outer tube, the improvement comprising a plurality of random indentations disposed around and in said outer tube to position said inner tube, coiled wire and outer tube in fixed position one to the other.

4,437,650

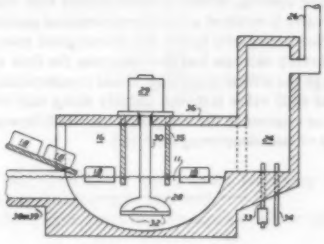
BRIQUETTE MELTING APPARATUS

Jan H. L. van Linden, Hampton Township, Allegheny County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 28, 1983, Ser. No. 470,476

Int. Cl.³ F27B *3/18*

U.S. Cl. 266—144 **7 Claims**



1. Apparatus for melting relatively large floating units of metal scrap in a molten melting media, the units having oxide films and solid and gaseous inclusions on and near the surfaces of the units as well as layers of freshly melted metal after the units enter the melting media, the apparatus comprising:

a bay for heating the molten media,

a bay for pumping the media from the heating bay to a circular charging bay,

a circular charging bay for receiving large floating units of metal scrap, and a rotor means located in said bay for moving the media therein at a velocity sufficient to remove the surface layers of the floating units such that new metal is continuously exposed to the melting media without the floating units being submerged in the media,

means for preventing the floating units from moving with the media in the charging bay,

a bay for collecting skim material,

inlet and outlet troughs extending tangentially to and from the circular charging bay for directing molten media respectively to the charging bay from the pumping bay, and from the charging bay to the skim collecting bay,

means for directing molten media from the skim collecting bay to the heating bay, and

a combustion chamber located adjacent the charging bay for burning organic material washed from the floating units by the molten media.

4,437,651

COOLING PLATE FOR BLAST-FURNACES

Jean Cordier, Dunkerque, and Pierre Rollot, Dunkerque Malo les Bains, both of France, assignors to Union Siderurgique du Nord et de l'Est de la France, Paris, France

Filed Nov. 9, 1981, Ser. No. 319,281

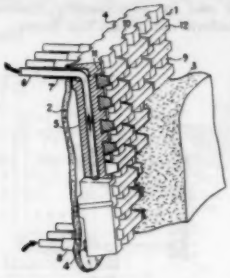
Claims priority, application France, Nov. 7, 1980, 8023805

Int. Cl.³ C21B *7/10*

U.S. Cl. 266—193 **5 Claims**

1. A cooling plate arrangement for use in a blast furnace, the plate being of cast iron and having a plurality of longitudinally arranged cooling tubes disposed within said plate and issuing from said plate on a common first side of said plate in the region of the upper and lower ends of said plate, said cooling plate arrangement further having a refractory lining afixed to a second side of said plate, said second side being opposite said first side, the improvement comprising means for adapting to horizontal and vertical deformations in said plate, said adapt-

ing means including a series of longitudinally and horizontally arranged grooves, in the surface of said second side, crossing at generally right angles to each other, with the areas between the grooves forming projections, so that the grooves facilitate



the bending without cracking of the plate in response to heat engendered deformations in the horizontal and vertical directions and simultaneously improve the afixing of said refractory lining to said second side of said plate.

4,437,652

VESSEL FOR THE TREATMENT OF MOLTEN METAL

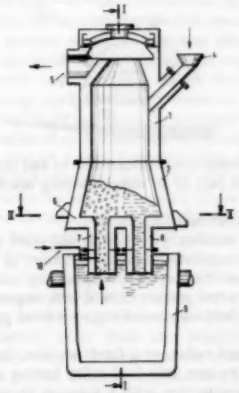
Richard A. Weber, Moers, and Carl-Heinz Schütz, Duisburg, both of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft Vorm.August Thyssen-Hutte, Duisburg, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,207

Claims priority, application European Pat. Off., Jul. 27, 1981, 81 105 911.2

Int. Cl.³ C21C *7/10*; C22B *9/04*

U.S. Cl. 266—275 **4 Claims**



1. A vessel for the continuous treatment of molten metals under reduced pressure, according the circulation process, especially for degassing steel melts, this vessel being provided, in its bottom, with an inlet pipe which dips into the molten metal, and an outlet pipe for the molten metal which has been treated, this outlet pipe being located so that it is spatially separated from the inlet pipe and, in particular, dipping into the molten metal, wherein the lower portion (2) of the vessel is widened, from the upper portion (1) of the vessel, towards the vessel-bottom (6), in a manner such that the diameter of the vessel-bottom (6) running through the axes of the inlet and outlet pipes (7 and 8) exceeds the corresponding diameter of the upper portion (1) of the vessel, and exceeds the diameter of the vessel-bottom (6) running perpendicularly thereto, between the inlet pipe (7) and the outlet pipe (8) which is not greater than the corresponding diameter of the upper portion (1) of the vessel.

4,437,653

FLUID-FILLED ENGINE MOUNT DEVICE

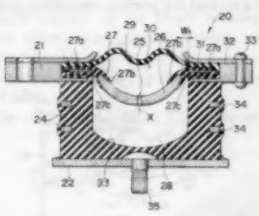
Toshihiko Kakimoto, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Feb. 16, 1982, Ser. No. 348,836

Claims priority, application Japan, Feb. 17, 1981, 56-21664

Int. Cl.³ F16F *5/00*

U.S. Cl. 267—140.1 **8 Claims**



1. A fluid-filled engine mount device comprising:

first and second base plate members which are spaced from each other and connected to a power unit side and a vehicle body side, respectively;

a block made of elastic material, interposed between said first and second base plate members and being formed with a cavity;

a partition plate member located in the vicinity of and spaced from said first base plate member, said partition plate member defining a fluid chamber on the elastic block cavity side and an auxiliary chamber on the opposite side relative to said fluid chamber, said auxiliary chamber being defined by a diaphragm member connected to said first base plate member, said partition plate member being formed with an orifice through which said fluid chamber is in communication with said auxiliary chamber, said fluid chamber and at least a part of said auxiliary chamber being filled with a fluid; and

an elastic support member for connecting said partition plate member with said first base plate member, said elastic support member including a secured section through which said elastic support member is secured to said first base plate member, and a generally annular section located inside of the inner wall surface of said elastic block cavity and inside of said first base plate member in the radial direction, and located between said secured section and the peripheral section of said partition plate member.

4,437,654

VISE WITH INTERCHANGEABLE JAW MEMBERS

Pietro Chiappetti, 5341 Hawley Ave., Los Angeles, Calif. 90042

Continuation of Ser. No. 357,061, Mar. 11, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 505,896

Int. Cl.³ B25B *1/24*

U.S. Cl. 269—283 **6 Claims**

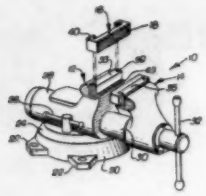
1. A vise for holding a workpiece in compression, comprising:

a vise body, said body including a base, a support housing mounted on said base, a fixed jaw on said support housing, a movable jaw, and a mechanism for moving said movable jaw in facing relation to said fixed jaw;

a pair of support blocks, one on said fixed jaw and one on said movable jaw, each of said support blocks having a pair of vertically extending ribs on the longitudinally opposed sides thereof and a longitudinally extending hori-

zontal ledge thereon, and having a generally flat front vertical surface extending between said pair of ribs, said ribs defining a corresponding pair of laterally outwardly open and vertically oriented slots disposed in positions spaced rearwardly from said front vertical surface by the thickness of said ribs; and

a pair of interchangeable jaw members, each of said interchangeable jaw members having a front working surface and a generally flat rear vertical surface, and a pair of generally L-shaped locking arms at longitudinally opposed sides of said rear vertical surface, said locking arms each having a first leg portion extending generally rearwardly from said rear vertical surface for a distance greater than the thickness of said ribs on said support blocks and a second leg portion extending generally later-



ally inwardly and having a size and shape relative to the size and shape of said slots on said support block for loose fitting locking reception of said locking arms of each of said jaw members with respect to said pair of vertically extending ribs on one of said support blocks, so that each of said interchangeable jaw members may be engaged to one of said support blocks to fit loosely thereon and moved downwardly by sliding until the sliding is stoppped by contact of said interchangeable jaw member with said longitudinally extending horizontal ledge, whereby said front vertical surface of said support block and said rear vertical surface of said jaw member are placed in a facing abutting relation when said front vertical surface of said jaw member is subjected to a rearwardly directed compressive force.

4,437,655

PROCESS AND APPARATUS FOR SEPARATING FLEXIBLE SHEETS FROM A STACK

Gaspar A. H. Bijttebier, Grote Heerweg 64, B-8749 Waregem-Beveren, and Jozef Vangheluwe, Roeselare, both of Belgium, assignors to Gaspar A. H. Bijttebier, Waregem-Beveren, Belgium

Filed May 6, 1981, Ser. No. 260,988

Claims priority, application Belgium, May 12, 1980, 1/9815

Int. Cl.³ B65H *3/22*

U.S. Cl. 271—3.1 **18 Claims**

1. An apparatus for separating flexible sheets individually from a stack of flexible sheets in successive separating cycles, comprising:

a first frame;

at least one vertically movable pick-up head in said first frame for successively separating said sheets individually from the top of a stack;

means for lowering said at least one pick-up head onto the top of a stack of flexible sheets;

means for removing each separated sheet out of said apparatus;

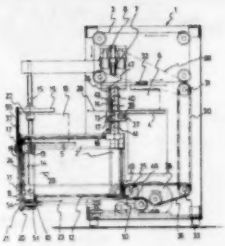
first and second vertically movable platforms each for supporting a stack;

at least one stack holder adapted to be fitted vertically through at least the entire thickness of a stack;

a second frame;

means in said second frame for piercing a stack with at least one stack holder in at least one place vertically through the entire thickness of the stack and through the top surface of the stack; and,

conveyor means circulating into and out of said first and second frames for alternately introducing one of said first and second support platforms with a full stack into said first frame and for subsequently removing the empty support platform out of said first frame;



the other of said support platforms being positioned for cooperation with said piercing means in said second frame while the one of said first and second support platforms is positioned for cooperation with said at least one vertically movable pick-up head in said first frame.

4,437,656

SHEET FEEDING DEVICE

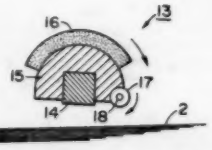
Shigeyoshi Onoda, Kawasaki, and Tateki Nagaoka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 64,896, Aug. 8, 1979, abandoned. This application Jun. 9, 1981, Ser. No. 271,856

Claims priority, application Japan, Aug. 29, 1978, 53-105150

Int. Cl.³ B65H *3/34*

U.S. Cl. 271—10 **30 Claims**



1. A sheet feeding device attachable to and detachable from a predetermined part of an image forming machine, comprising:

means for accommodating sheets;

a supporting member, provided in said sheet accomodating means, for supporting a stack of sheets to be fed therefrom, means for pivotally supporting said supporting member at a rear portion thereof with respect to the direction of the feed and means urging a front portion thereof upwardly;

a rotatable feed roller, at a fixed position, for feeding the sheets one by one, said feed roller having an incomplete circular cross-section with a segment thereof cut away, wherein the cut-away portion of the roller, when feeding is not taking place, is opposed to the topmost sheet of the stack of sheets, and upon feeding operation, the circular section of the roller is in contact with the topmost sheet to feed it;

a register roller for synchronizing the sheet fed out by said feed roller with an image to be formed therein; and

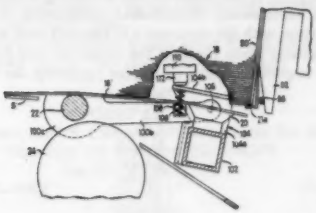
a displacing member, so disposed relatively to said circular section of the roller as to be downwardly movable with the rotation of the feed roller, and to displace the topmost sheet downwardly to a predetermined position before said feed roller is brought into contact with the topmost sheet, said displacing member maintaining, during non-feeding, a state of non-contact with the topmost sheet.

4,437,657

SUCTION CUP APPARATUS FOR FEEDING A SHEET FROM THE BOTTOM OF A STACK

Martin Selak, Des Plaines, Ill., assignor to Astro Machine Corp., Ill.

Filed Jun. 15, 1981, Ser. No. 273,573
Int. Cl.³ B65H 3/08
U.S. Cl. 271—100 12 Claims



1. In feeding apparatus for feeding sheet material one at a time from the bottom of the stack of the same, said apparatus including a horizontal support for a stack of sheets, stacking means for retaining on said horizontal support a vertical stack of sheet material, said horizontal support terminating short of the front end of the stack to provide a feed opening exposing the front end portion of the bottom sheet in the stack, support ledge-forming means confronting said feed opening for supporting the weight of the front end of the stack of sheets, means for withdrawing the bottommost sheet from the bottom of the stack through said feed opening and including suction cup means for engaging the bottom surface of the exposed end portion of the bottommost sheet in the stack and by force of suction therefrom and pulling the same downwardly from the stack through the feed opening, the improvement in movable support structure for said suction cup means and including carrier means bodily movable between an initial lowered position to a raised position where the suction cup means carried thereby initially contacts and then pushes upwardly against the exposed end portion of the bottommost sheet in the stack, mounting means upon which said suction cup means are directly supported, said mounting means being mounted for pivotal movement upon said carrier means so that the suction plane of the mouths of said suction cup means can be adjusted to different angles of inclination relative to said carrier means, and position control means for controlling the position and inclination of said mounting means on said carrier means by raising said carrier means to a position where the suction cup means on said mounting means initially engages the bottom surface of the bottommost sheet of the stack, with the suction plane thereof parallel to the sheet, and then raising the same a small distance further while tilting said mounting means on said carrier means in a direction away from the said support ledge-forming means and without any substantial horizontal movement thereof away from said support ledge-forming means, and following which said carrier means is lowered to pull the front end of the bottommost sheet past said support ledge-forming means with a wiping contact thereof to withdraw only the bottommost sheet from the stack.

4,437,658

BOTTOM SHEET FEED SYSTEM

Raymond E. Olson, Pompano Beach, Fla., assignor to Profold, Inc., Pompano Beach, Fla.

Filed Jul. 30, 1981, Ser. No. 288,486
Int. Cl.³ B65H 3/52
U.S. Cl. 271—125 7 Claims

1. A bottom sheet feed system for automatically feeding a stack of sheets, comprising:

a slanted feed surface slanted between 15° and 45° and having means for receiving the stack of sheets;

a first aperture in the feed surface at a location to be beneath the stack of sheets;

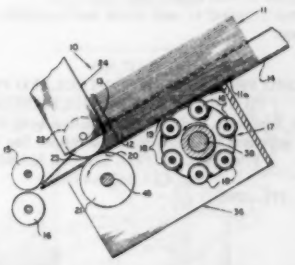
a rotatable agitator wheel formed of a plurality of evenly spaced freely rotating agitator rollers beneath the feed surface and partially projecting upwardly through said first aperture, the agitator rollers being evenly spaced from a central axis of the wheel and along a circle, the rollers being spaced from one another and being positioned beneath the feed surface such that when the rollers strike a bottom-most sheet, it is partially lifted from its rest position on the feed surface;

all of the rollers being of the same dimensions and of the same material having a coefficient of friction sufficiently low to prevent wrinkling or bending the bottom-most sheet;

a peripheral surface of the freely rotating rollers of the agitator wheel being slightly convex and formed of a fiberous material;

first drive means for rotating the agitator wheel in a direction of feed;

at an edge of the feed surface a feed nip means being positioned for permitting feed of a single bottom sheet from a leading edge of the stack of sheets;



said feed nip means comprising a rotatable feed wheel substantially beneath the feed surface and a stationary retard surface adjacent the feed wheel;

a spacing of the feed nip means being adjustable by providing an adjustment means for moving the retard surface relative to the feed wheel;

second drive means connected for driving the feed wheel in the feed direction;

the edge at which the feed nip means is located comprising a second aperture in the feed surface;

the stationary retard surface of the feed nip means comprising a stationary retard wheel mounted below and in a pocket portion of a support member having a perpendicular abutment surface against which uppermost sheets of the stack of sheets abut, and wherein lower-most sheets of the stack are fanned along the retard wheel, said retard wheel being dimensioned to contact no more than a ¾" thick stack of the bottom-most sheets; and

the sheet feed system being capable of handling at least 10,000 sheets per hour.

4,437,659

ROTARY DRUM FOR PROCESSING SHEET MATERIALS

Christopher D. Caron, Longmont, and Donald W. Schaefer, Lakewood, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 191,582, Sep. 29, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,722
Int. Cl.³ B65H 29/32
U.S. Cl. 271—276 7 Claims

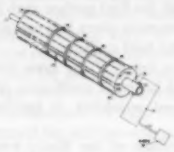
1. In a document transport system wherein flexible rectangular sheets are loaded in seriatim onto a transport mechanism for

transport through a processing station, and are unloaded from said transport mechanism, the improvement comprising:

a transport mechanism including a low inertia rotary vacuum drum;

said rotary vacuum drum having a cylindrical surface for supporting the sheets;

said cylindrical surface having a plurality of elongated slots with a plurality of communicating ports disposed in said



slots, said elongated slots being configured into groups with each group having a different population of communicating ports and operable to generate different pressure zones on said surface;

a low vacuum, high flow blower operable to evacuate the interior of said drum; and

a motor coupled to said drum and operable to rotate the drum.

4,437,660

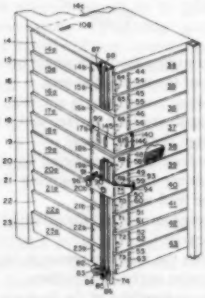
WORD PROCESSOR—CONTROLLED PRINTER OUTPUT SCANNER MECHANISM

Elliot N. Tompkins, and Sherman S. Kline, both of San Antonio, Tex., assignors to Datapoint Corporation, San Antonio, Tex.

Filed Nov. 16, 1981, Ser. No. 321,808

Int. Cl.³ B65H *43/08*

U.S. Cl. 271—290 **10 Claims**



1. A word processor-controlled printer output bin apparatus having a scanning means comprising:

a word processing bin module having a plurality of output bins for receiving printed documents from a word processor;

a scanning means for scanning the plurality of output bins, said scanning means having a signal generating means and a signal detector means to detect a signal from the signal generating means to determine from interruptions in the signal as each output bin is scanned the presence or absence of documents in an output bin to provide an indication to a word processor-controlled printer of the availability of the output bin for receipt of documents and the amount of documents it is capable of receiving.

4,437,661

FOOTBALL KICKING TRAINER TOY

John P. Chavez, 1522 S. Lamar St., Lakewood, Colo. 80226

Filed Apr. 21, 1981, Ser. No. 256,012

Int. Cl.³ A63B *67/00*

U.S. Cl. 273—55 R **2 Claims**

1. An improved football kicking trainer employing a goal-post of the type having a base adapted to rest upon an underlying surface, a standard connected to the base and extending upwardly therefrom, a support arm extending laterally of the standard and connected to the standard near the upper end of the standard, a cross-bar connected centrally to the support arm and extending transversely to the standard and to the support arm in a substantially horizontal plane and offset laterally from the standard, and a pair of upright bars attached near opposite ends of the cross-bar and extending upwardly therefrom in substantially independent relationship to define in combination with the cross-bar a U shaped frame in a substantially vertical plane through the cross-bar; and employing a flexible impact damping means for receiving the force of a

light weight football when, in use, such a football is directed through the U shaped frame, wherein the improvement comprises: each upright having attached at its upper end a pivoted extension arm extendable upward and in a direction rearward of said goal post,

said impact damping means being suspended from each said extension arm substantially solely under force of gravity on the side of the U shaped frame opposite from the direction of lateral extension of the support arm from the standard such that the impact damping means is spaced apart from the cross-bar by at least the length of said support arm for creating a horizontal ball reception area between the cross-bar and impact damping means.

4,437,662

STRING LOAD APPORTIONED RACKET

Tsai C. Soong, 1839 Jackson Rd., Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 228,577, Jan. 26, 1981, Pat. No. 4,333,650, which is a continuation-in-part of Ser. No. 136,907, Apr. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 120,160, Feb. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 68,572, Aug. 22, 1979, abandoned. This application May 10, 1982, Ser. No. 376,592

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.³ A63B *51/00*

U.S. Cl. 273—73 D **11 Claims**

1. A racket having a hand grip joined to a frame supporting a string network having transverse and longitudinal strings extending throughout a ball-hitting region spaced from said

grip, said frame having a shank region extending from said grip and flaring outward in a throat region and a generally oval region extending around said ball-hitting region, said racket comprising:

a. at least a central plurality of said longitudinal strings having a strung length at least 30% longer than the longest transverse string in said network;

b. said central plurality of longer longitudinal strings including at least one-third of all the longitudinal strings in said ball-hitting region; and

c. said longer longitudinal strings being strung with at least 30% more tension than said transverse strings.

4,437,663

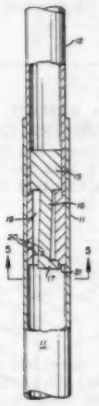
GOLF CLUB

Clem C. Crisci, 1103 S. Croton Ave., New Castle, Pa. 16103

Filed Mar. 15, 1982, Ser. No. 358,274

Int. Cl.³ A63B 53/14

U.S. Cl. 273—81.2 **5 Claims**



1. A two-part golf club comprising a lower portion and an upper portion, a hand grip on said upper portion and a club head on said lower portion, means for movably securing said upper and lower portions together wherein said means comprises a plug secured in the end of one of said club portions, an elongated pin extending from said plug, a sidewardly extending tab on the free end of said pin, a lock fitting having an opening therethrough, a slot in the side of said opening and said lock fitting secured in the end of other said club portions, the ends of said club portions having said plug and said lock fitting arranged for mutual engagement, a recessed area in said lock fitting comprising a ramp in the form of a partial spiral, an offcenter annular shoulder adjacent said ramp, said tab slidable on said ramp and against said annular shoulder to a locked position when said portion having said plug and pin is rotated.

4,437,664

PIN BALL GAME WITH OSCILLATING SHOOTER

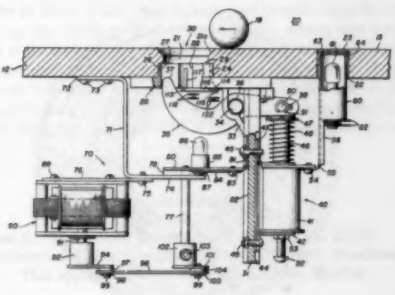
Max Wiczer, Skokie, and Albin Peters, Chicago, both of Ill., assignors to Wico Corporation, Niles, Ill.

Filed Nov. 30, 1981, Ser. No. 326,172

Int. Cl.³ A63F 7/02, 7/26

U.S. Cl. 273—121 A **18 Claims**

1. Ball control apparatus for use in a pin ball game including a playfield board on which a pin ball rolls for engagement with one or more targets, said ball control apparatus comprising a frame mounted for rotational movement about a predetermined axis, receptacle means carried by said frame for rotation therewith and adapted for receiveing a ball coaxially with said axis, ball propelling means carried by said frame for rotation therewith and disposed for engagement with a ball disposed in said receptacle means, said ball propelling means being movable in a plane disposed substantially perpendicular to the playfield board for propelling the ball into rolling engagement with the playfield board along the intersection thereof with said plane, first drive means coupled to said frame for effecting continual rotational movement thereof through a predetermined range of movement thereby to vary the orientation of said plane and the direction in which the ball may be propelled along the playfield board, second drive means coupled to said ball propelling means for effecting propelling movement thereof in said plane, and control means coupled to said first



and second drive means and including the first and second actuating means, said first actuating means being responsive to reception of a ball in said receptacle means for actuating said first drive means and for enabling said second actuating means, said second actuating means being selectively operable after enablement thereof for actuating said second drive means, said control means including deactuating means responsive to propelling movement of said ball propelling means in said plane for deactuating said first drive means and disabling said second actuating means.

4,437,665

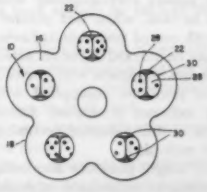
DICE BOX

Ora Coster, 7 Bet Horon St., Tel Baruch 69987, Israel

Filed Feb. 9, 1982, Ser. No. 347,358

Int. Cl.³ A63F 9/04

U.S. Cl. 273—138 R **5 Claims**



1. Pattern generating apparatus comprising:

a housing defining first and second parallel planar surfaces,

said surfaces being formed with apertures arranged in facing registration and defining a plurality of sockets; and

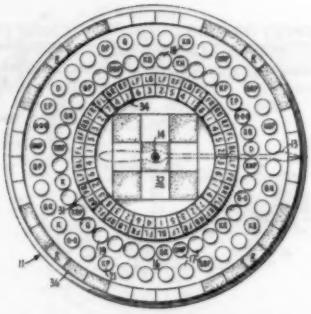
a plurality of pattern bearing elements universally rotatably retained in said plurality of sockets, each element defining pairs of parallel opposite pattern bearing planar surfaces, said elements being arranged with respect to said sockets such that, when said housing is disposed adjacent a flat surface, each of said pattern bearing elements engages said surface and is universally rotatable thereby so that when one of said pattern bearing surfaces lies parallel to said first parallel planar surface the opposite parallel pattern bearing surface is caused to lie parallel to said second parallel planar surface whereby a clear pattern indication is displayed through said apertures.

4,437,666

MECHANICALLY PROGRAMMABLE CHESS PLAY INDICATOR

John J. Moylan, 658 Aipuni St., Honolulu, Hi. 96821

Filed Aug. 24, 1981, Ser. No. 295,380
Int. Cl.³ A63F 3/02
U.S. Cl. 273—141 R **3 Claims**



1. A mechanically programmable chess play indicator, comprising:

a flattened supporting body,

an elongated pointer pivotally mounted on said supporting body for free spinning rotation sweeping a circular area thereof,

a plurality of objects colored to correspond to the white and black chessmen and arrayed in concentric circles surrounding the pivotal mounting of said pointer and in equally circumferentially spaced relation to each other, with the objects corresponding to the white chessmen being *interchangeable with each other* in one circle and the objects corresponding to the black chessmen being *interchangeable with each other* in the other circle, the positions for said objects in said circles exeeding the total number of chessmen represented by said objects in said circles whereby desired ones of said positions are unsupplied with said indicia corresponding with the conventional chessmen so that, when said pointer comes to rest not aligned with one of said objects having such indicia, said pointer may be indexed in the chosen direction of rotation until it reaches alignment with one of the said objects, the number of positions unsupplied with indicia before a particular indicium is reached determining the relative probability of that indicium becoming aligned with said pointer of each play,

a plurality of knight positions also being provided on said body *at positions individually alignable with said pointer,* each of such knight positions being occupied by an indicium indicating a possible knight move whereby, when the first spin of said pointer indicates a knight is to be moved, a second spin causes the pointer to become aligned with one of said knight positions and thus indicate the move to be made by such knight,

and wherein a plurality of move extent positions are also provided on said body *at positions individually alignable with said pointer,* each of which is occupied by a number indicating the number of consecutive squares on the chessboard which chosen queen and bishops and rooks are to move whereby, when the first spin of said pointer indicates a queen or bishop or rook or pawn is to be moved, another spin causes the pointer to become aligned with one of said move extent positions and thus indicate the number of squares the indicated piece is to move, and

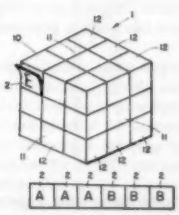
wherein a checkerboard having nine alternating light and dark squares is provided on said body centered on the pivotal mounting of said pointer whereby, when the first spin of said pointer indicates a king or queen or bishop or rook or pawn is to be moved, another spin causes said pointer to indicate the direction the indicated piece is to move.

4,437,667

GEOMETRIC GAME

Ronald L. Miller, 7300 Cascade Rd., Grand Rapids, Mich. 49508

Filed Apr. 8, 1982, Ser. No. 366,607
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **11 Claims**



1. A game comprising:

a playing unit having a multi-faced geometric configuration, each face of said playing unit having a plurality of affixing facets, all of said faces having an identical number and arrangement of said facets, said playing unit having twisting means for maintaining said facets in a single unit and allowing any linear combination of said facets on any one of said faces to be twisted so as to be disposed on a different face and simultaneously changing the location of corresponding facets on corresponding faces;

a plurality of markers, each marker carrying one of a plurality of indicia, at least some of said indicia being orientatable, said plurality of indicia having more distinguishable indicia than the number of said faces of said playing unit;

affixing means for repeatedly removably affixing each of said individual markers to each of said facets, said markers being selected and affixed by a player to said facets of said playing unit to provide a recognizable pattern of indicia as a desired starting configuration, the playing unit being twisted by the player with said markers affixed thereto to disorganize said player selected configuration of said markers while said markers remain affixed to said unit, said playing unit being twisted by the player to return said markers to the player selected starting configuration;

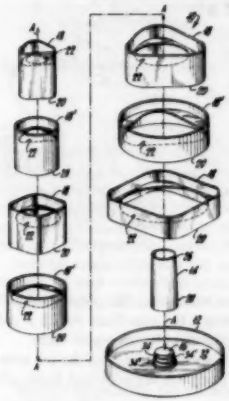
whereby said markers can be affixed to said facets in any desired combination by a player and be removed from said playing unit when said player selected starting configuration is reproduced or to commence a new pattern of play

prior to termination of the previous pattern of play, and reaffixed to said facets in a different combination.

4,437,668
PUZZLE POST TOY

Danny E. Simpson, Baltimore, Md.; David M. Williams, New York, N.Y.; Richard A. Chase, Baltimore, and Lawrence B. Grubb, Monkton, both of Md., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Jun. 4, 1982, Ser. No. 385,146
Int. Cl.³ A63F 9/12
U.S. Cl. 273—156 **16 Claims**



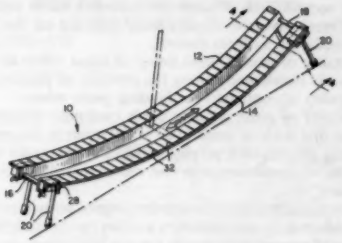
1. A puzzle toy comprising:
a generally planar base;
a post upstanding from said base;
a plurality of pieces, each having a planar aperture for fitting around said post and a bottom for resting on said base;
said pieces each having an axial direction perpendicular to said planar aperture and each piece projecting onto a plane perpendicular to said axial direction a closed geometric figure, said geometric figure having a long dimension;
each of said pieces projecting said geometric figure having a different long dimension;
at least one of said geometric figures being circular and at least one of said geometric figures being non-circular;
said aperture of each piece being large enough to accommodate each of the other pieces having a smaller long dimension and not large enough to accommodate any other piece having a larger long dimension;
whereby said pieces may be stacked onto said post in any order and, by sufficient manipulating without removal from said post, can be made to assume a stable configuration in size order about said post.

4,437,669
GOLF PRACTICE PUTTING TRACK

David T. Pelz, 25 Tamarisk Cir., Abilene, Tex. 79606

Filed Sep. 29, 1982, Ser. No. 428,337
Int. Cl.³ A63B 69/36
U.S. Cl. 273—186 C **4 Claims**

1. A golf putting practice apparatus for providing a visual, audible, and tactual indication of an improper stroke comprising a putting track formed of a pair of rails, L-shaped in cross section, spaced apart forming a channel and adapted to accommodate a putter head between them, said rails being arcuate in shape, having the lowermost portion at the center of each of said rails and the uppermost portions at each of the ends thereof, the radius of curvature of said arcuate rails approximating the path of a putter head during a normal putting stroke; said rails further including a series of indicia lines on the upper surface thereof and perpendicular to the longitudinal axes of said rails, said indicia lines being adapted to cooperate with a similar indicia line on a putter head to provide a visual indication of the position of said putter head with respect to said rails during the entire putting stroke whereby deviation of the putter head from a line perpendicular to the longitudinal axis of said rails will cause the said indicia line on said putter head to be at an angle with respect to said series of indicia lines



on said rails, said apparatus further including means for adjusting the position of said rails with respect to each other thereby varying the width of said channel within which said putter head is stroked so that diviations of said putter head from a straight line perpendicular to the longitudinal axis of said channel will cause said putter head to strike the side of said rails providing an audible and a tactual indication that said putter head has not followed a straight line defined by said rails.

4,437,670
CARD GAME

Lillian D. Simon, 2000 S. Eads St., Arlington, Va. 22202

Continuation of Ser. No. 268,578, May 29, 1981, abandoned. This application Dec. 23, 1982, Ser. No. 452,794
Int. Cl.³ A63F 1/04
U.S. Cl. 273—296 **2 Claims**

1. A card game for a plurality of players comprising
a first deck of cards including forty three cards,
a first decorative back surface on each of the first deck of cards,
a different playing surface on each of the first deck of cards,
an investment opportunity depicted on the playing surface of each of forty of said first deck of cards with a different opportunity shown on each card,
a second deck of cards having the same number of cards as the first deck of cards,
a second decorative back surface on each of the second deck of cards different from the first decorative back surface so that the first and second decks of cards are distinguishable from each other,

said surfaces being formed with apertures arranged in facing registration and defining a plurality of sockets; and

a plurality of pattern bearing elements universally rotatably retained in said plurality of sockets, each element defining pairs of parallel opposite pattern bearing planar surfaces, said elements being arranged with respect to said sockets such that, when said housing is disposed adjacent a flat surface, each of said pattern bearing elements engages said surface and is universally rotatable thereby so that when one of said pattern bearing surfaces lies parallel to said first parallel planar surface the opposite parallel pattern bearing surface is caused to lie parallel to said second parallel planar surface whereby a clear pattern indication is displayed through said apertures.

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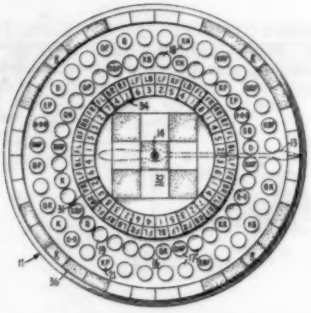
Filed Aug. 24, 1981, Ser. No. 295,380
Int. Cl.³ A63F *3/02*
U.S. Cl. 273—141 R **3 Claims**



1. A mechanically programmable chess play indicator, comprising:

a flattened supporting body,

an elongated pointer pivotally mounted on said supporting body for free spinning rotation sweeping a circular area thereof,

a plurality of objects colored to correspond to the white and black chessmen and arrayed in concentric circles surrounding the pivotal mounting of said pointer and in equally circumferentially spaced relation to each other, with the objects corresponding to the white chessmen being *interchangeable with each other* in one circle and the objects corresponding to the black chessmen being *interchangeable with each other* in the other circle, the positions for said objects in said circles exeeding the total number of chessmen represented by said objects in said circles whereby desired ones of said positions are unsupplied with said indicia corresponding with the conventional chessmen so that, when said pointer comes to rest not aligned with one of said objects having such indicia, said pointer may be indexed in the chosen direction of rotation until it reaches alignment with one of the said objects, the number of positions unsupplied with indicia before a particular indicium is reached determining the relative probability of that indicium becoming aligned with said pointer of each play,

a plurality of knight positions also being provided on said body *at positions individually alignable with said pointer,* each of such knight positions being occupied by an indicium indicating a possible knight move whereby, when the first spin of said pointer indicates a knight is to be moved, a second spin causes the pointer to become aligned with one of said knight positions and thus indicate the move to be made by such knight,

and wherein a plurality of move extent positions are also provided on said body *at positions individually alignable with said pointer,* each of which is occupied by a number indicating the number of consecutive squares on the chessboard which chosen queen and bishops and rooks are to move whereby, when the first spin of said pointer indicates a queen or bishop or rook or pawn is to be moved, another spin causes the pointer to become aligned with one of said move extent positions and thus indicate the number of squares the indicated piece is to move, and

wherein a checkerboard having nine alternating light and dark squares is provided on said body centered on the pivotal mounting of said pointer whereby, when the first spin of said pointer indicates a king or queen or bishop or rook or pawn is to be moved, another spin causes said pointer to indicate the direction the indicated piece is to move.

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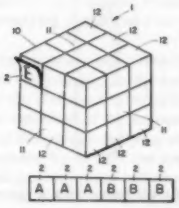

1. A game comprising:

a playing unit having a multi-faced geometric configuration, each face of said playing unit having a plurality of affixing facets, all of said faces having an identical number and arrangement of said facets, said playing unit having twisting means for maintaining said facets in a single unit and allowing any linear combination of said facets on any one of said faces to be twisted so as to be disposed on a different face and simultaneously changing the location of corresponding facets on corresponding faces;

a plurality of markers, each marker carrying one of a plurality of indicia, at least some of said indicia being orientatable, said plurality of indicia having more distinguishable indicia than the number of said faces of said playing unit;

affixing means for repeatedly removably affixing each of said individual markers to each of said facets, said markers being selected and affixed by a player to said facets of said playing unit to provide a recognizable pattern of indicia as a desired starting configuration, the playing unit being twisted by the player with said markers affixed thereto to disorganize said player selected configuration of said markers while said markers remain affixed to said unit, said playing unit being twisted by the player to return said markers to the player selected starting configuration;

whereby said markers can be affixed to said facets in any desired combination by a player and be removed from said playing unit when said player selected starting configuration is reproduced or to commence a new pattern of play

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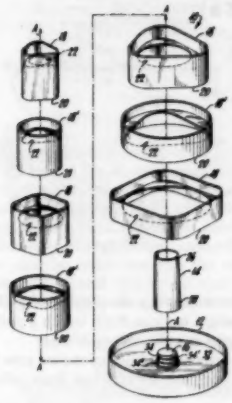
U.S. Cl. 273—156 **16 Claims**



1. A puzzle toy comprising:
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a post upstanding from said base;
a plurality of pieces, each having a planar aperture for fitting around said post and a bottom for resting on said base;
said pieces each having an axial direction perpendicular to said planar aperture and each piece projecting onto a plane perpendicular to said axial direction a closed geometric figure, said geometric figure having a long dimension;
each of said pieces projecting said geometric figure having a different long dimension;
at least one of said geometric figures being circular and at least one of said geometric figures being non-circular;
said aperture of each piece being large enough to accommodate each of the other pieces having a smaller long dimension and not large enough to accommodate any other piece having a larger long dimension;
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Int. Cl.³ A63B *69/36*
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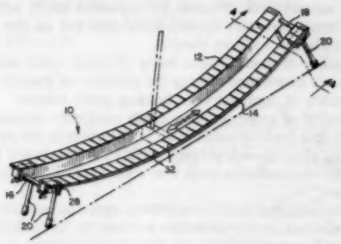

on said rails, said apparatus further including means for adjusting the position of said rails with respect to each other thereby varying the width of said channel within which said putter head is stroked so that diviations of said putter head from a straight line perpendicular to the longitudinal axis of said channel will cause said putter head to strike the side of said rails providing an audible and a tactual indication that said putter head has not followed a straight line defined by said rails.

4,437,670

CARD GAME

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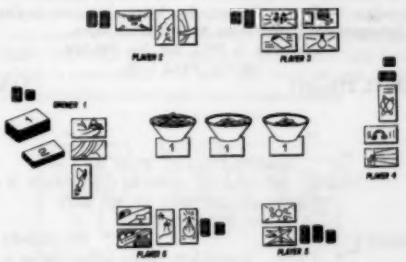
Continuation of Ser. No. 268,578, May 29, 1981, abandoned.
This application Dec. 23, 1982, Ser. No. 452,794
Int. Cl.³ A63F *1/04*
U.S. Cl. 273—296 **2 Claims**



1. A card game for a plurality of players comprising
a first deck of cards including forty three cards,
a first decorative back surface on each of the first deck of cards,
a different playing surface on each of the first deck of cards,
an investment opportunity depicted on the playing surface of each of forty of said first deck of cards with a different opportunity shown on each card,
a second deck of cards having the same number of cards as the first deck of cards,
a second decorative back surface on each of the second deck of cards different from the first decorative back surface so that the first and second decks of cards are distinguishable from each other,

a different playing surface on each of the second deck of cards,

an investment opportunity depicted on the playing surface of each of forty said second deck of cards with a different opportunity shown on each card and being in one-to-one correspondence with the playing surface on each of the forty cards in said first deck of cards whereby the playing surfaces of the forty cards in said second deck of cards are identical to the playing surfaces of the forty cards in said first deck of cards,

three of the first deck of cards and a corresponding three of the second deck of cards are maverick cards with three different maverick opportunites depicted on the respective playing surfaces thereof,

a plurality of game tokens being of equal value and being equally distributed among the plurality of players,

a plurality of containers for holding game tokens,

a plurality of game winning cards randomly selected from said first deck of cards at an initial point in the game and being placed, with playing surfaces down, under the plurality of containers with one winning card for each container,

a broker selected from among the players, an auction session conducted by the broker to auction the forty-three cards in said second deck to the players in response to highest bids paid by the tokens of the player who made the highest bid, said paid tokens being randomly placed in the containers,

a selling session among the players wherein the cards of said second deck may be purchased for said tokens,

a trading session wherein the cards of said second deck may be traded among the players,

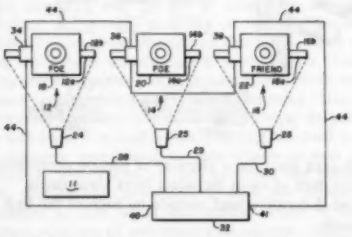
a recall session wherein the broker uses the first deck of cards from which the winning cards were initially removed to recall one by one the corresponding cards of the second deck until all of the second deck cards are surrendered except the winning cards, and

the winning cards under the token containers being exposed face up to be matched with corresponding cards held by the players who receive the tokens in such containers whereupon a game winner is indicated by the player amassing the most tokens.

4,437,671
DUELING INTERACTIVE TARGET SYSTEM

Theodore N. Busch, Minneapolis, Minn., assignor to Caswell International Corporation, Minneapolis, Minn.

Filed Feb. 8, 1982, Ser. No. 346,504
Int. Cl.³ F41J 5/00
U.S. Cl. 273—372 **7 Claims**



1. A hit indicating apparatus for a multiple target shooting range, comprising, in combination:

an electrical circuit, including;

power means;

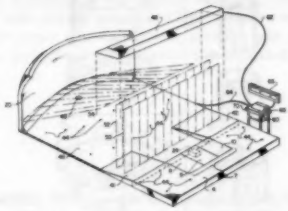
indicator means;

at least two target means, each of which includes hit sensor means, said sensor means including an input lead and an output lead, said sensor means joined in a series array so that the initial input and final output leads of said sensors of said series connect into said electrical circuit whereby when any target is struck a display indication is provided by said indicator means.

4,437,672
GOLF GAME SIMULATING APPARATUS

Robert J. Armantrout; George E. Gerpheide, both of Salt Lake City, Utah, and Robert F. Wilson, deceased, late of Salt Lake City, Utah (by Robert D. Wilson, personal representative), assignors to Robert D. Wilson, Salt Lake City, Utah, personal representative of Robert F. Wilson, deceased

Filed Dec. 1, 1980, Ser. No. 211,622
Int. Cl.³ A63B 69/36
U.S. Cl. 273—185 B **20 Claims**



1. Apparatus for simulating the playing of golf comprising:

a support defining a tee area from which a golf ball may be driven by a player utilizing a golf club;

a target screen disposed in front of the tee area for receiving balls driven from the tee area and from which balls will rebound;

first sensor means including means for calculating the speed of a ball and including means for detecting the direction of travel of said ball driven from the tee area toward the screen;

first computing means (response) responsive to said first sensor means for producing an estimate of the distance of travel and ultimate resting position the driven ball would have if allowed free flight;

a cup disposed in front of the tee area close to said target screen into which rebounded balls may fall, said cup having an upper rim that is generally flush with a floor surface placed between said target screen and tee area support;

second sensor means for detecting when a ball falls into said cup; and

logic means for indicating a holed-out condition when said second sensor means detects a ball in said cup and when the first computing means determines that the ultimate resting position of the driven ball is within a predetermined distance from a golf hole location, said golf hole location being representative of the location of a simulated golf hole towards which the player has driven the golf ball.

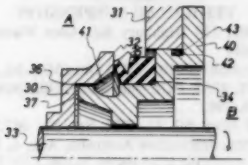
4,437,673
SEALING DEVICE

Yoshiaki Miyamoto, Fukushima, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,404
Claims priority, application Japan, Oct. 21, 1980, 55-150340[U]
Int. Cl.³ F16J 15/16, 15/34
U.S. Cl. 277—65 **7 Claims**

1. A sealing device for sealing the gap between two relatively rotatable machine members such as a rotating shaft extending through a housing with a gap therebetween comprising: a first seal member mounted on the rotating shaft to be

rotated thereby having a substantially axially extending body portion and a radial component formed integral with and extending radially outwardly from said body portion, said body portion forming an annular groove on the radially outer surface thereof; a second seal member mounted on said housing in cooperating sealing relationship with said first seal member comprising, a reinforcement member made of metal plate extending substantially radially in said gap, a seal lip made of resilient rubber provided at the radially inner end of said reinforcement member and extending radially outwardly at an



angle with respect to the shaft and in sliding contact with said radial component of said first member, and an axially extending radially inner circumferential surface on said radially inner end of said reinforcement member; and a cylindrical axial component extending axially from said body portion of said first sealing member and offset radially outwardly therefrom to form a narrow annular space between the radially outer circumferential surface of said cylindrical axial component and said inner circumferential surface of said reinforcement member.

4,437,674

FLUID SEALING DEVICES

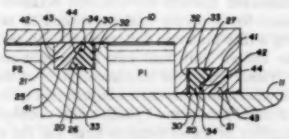
George K. Fling, Dallas, Tex., assignor to Vought Corporation, Dallas, Tex.

Division of Ser. No. 189,548, Sep. 22, 1980, Pat. No. 4,380,342. This application Sep. 3, 1982, Ser. No. 414,700

The portion of the term of this patent subsequent to Apr. 19, 1990, has been disclaimed.

Int. Cl.³ F16J *15/09*

U.S. Cl. 277—188 A **6 Claims**



1. Apparatus for forming a fluid seal between mating surfaces of first and second members movable with respect to each other wherein said second member separates a first area containing a fluid at a first pressure and a second area containing a fluid at a second, lower pressure, said second member having a recess formed therein, said recess having a bottom wall and a side wall extending substantially perpendicularly from said bottom wall and forming a substantially right angle therewith, said apparatus comprising:

(a) an elastomeric sealing device contained within said recess in one of said mating surfaces and contacting the other of said mating surfaces;

(b) a resilient anti-extrusion device which is more rigid than said sealing device and which is substantially a right trapezoid in cross-section contained within said recess, the longer leg thereof confronting said elastomeric sealing device, the longer base thereof contacting said other of said mating surfaces, the shorter leg thereof confronting said recess sidewall, the shorter base thereof confronting said recess bottom wall, the right angle formed between said shorter base and said shorter leg mating with the substantially right angle formed between said recess sidewall and bottom wall;

(c) Wherein said elastomeric sealing device is disposed between said resilient anti-extrusion device and said first area.

4,437,675

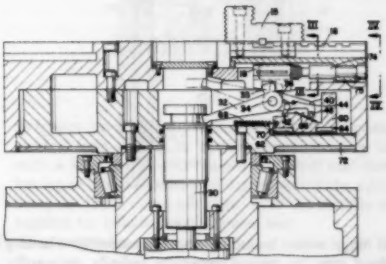
CHUCK WITH CENTRIFUGAL FORCE COMPENSATION

C. Fred Koenig, III, Montgomery, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 12, 1982, Ser. No. 397,622

Int. Cl.³ B23B *31/14*

U.S. Cl. 279—1 C **10 Claims**



7. A chuck having a plurality of chuck jaws and a centrifugal counterbalance associated with each jaw, said centrifugal counterbalance comprises:

a first lever pivoted about an axis;

connecting means for connecting said first lever to an associated chuck jaw for moving said first lever and said chuck jaw in unison;

a second lever pivoted about the same axis as said first lever;

latch means movable between a latched position, locking said first and second levers for movement together in one direction, and an unlatched position, permitting independent movement of said first and second levers;

a counterweight movable from a stop position, engaging and moving said latch means to an unlatched position, to a position, not engaging said latch means and where said latch means is in a latched position, and movable outward under centrifugal force to apply force to said second lever which is transmitted thru said first lever to said chuck jaws providing centrifugal force compensation.

4,437,676

MOBILE TRAVEL TRUNK

John V. Kitrell, 4639 Holdrege, Lincoln, Nebr. 68503

Filed Sep. 23, 1982, Ser. No. 422,003

Int. Cl.³ B62D *61/00*

U.S. Cl. 280—78 **8 Claims**

1. A mobile travel trunk, comprising,

a trunk means having rearward and forward ends, a top, a bottom and opposite side walls which define a compartment area,

means on the forward end of said trunk means for securing said trunk means to a vehicle,

a wheeled-suspension means operatively secured to said bottom of said trunk means,

said rearward end of said trunk means having a trapezoidal shaped opening formed therein defined by upper and lower edges and a pair of side edges,

said rearward end of said trunk means having a U-shaped lip at said upper edge and said side edges of said opening,

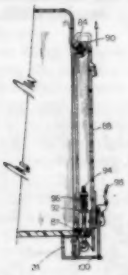
a trapezoidal shaped door pivotally mounted at the rearward end of said trunk means along the lower edge of said

opening and being movable between open and closed positions,

said door having upper and lower edges and a pair of side edges,

said door having a U-shaped lip at its upper edge and at its side edges which are adapted to be received by said U-shaped lip at the upper and side edges of said opening when said door is in its closed position,

hinge means pivotally securing said door to said trunk means,



said hinge means including a spring assembly whereby said door may be moved generally radially outwardly and upwardly with respect to said trunk means against the urging of said spring assembly to permit said U-shaped lip on said door to clear said U-shaped lip on the rearward end of said trunk means during opening and closing operations of said door, said spring assembly urging said door downwardly in the closed position thereof, and

a latch assembly having a latch member mounted adjacent the lower edge of said door and releasably engaging a latch plate connected to said bottom wall for preventing upward movement of said door in the closed position.

4,437,677

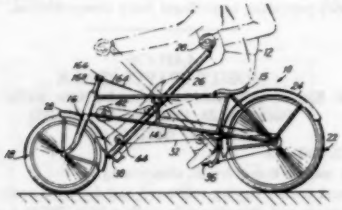
HAND AND/OR FOOT PROPELLED VEHICLE

Haig Ksayian, Box 52, Bear Tavern Rd., Titusville, N.J. 08560

Filed Feb. 9, 1982, Ser. No. 347,306

Int. Cl.³ B62M *1/12*

U.S. Cl. 280—234 **45 Claims**



1. A wheeled vehicle adapted to be propelled by a rider comprising:

a frame,

at least one front and rear wheel rotatably mounted on said frame;

a tiller tube, having a pair of handle bars at one end thereof and a pair of foot pedals at the other end thereof for oscillatory movement of said tiller tube about an axis;

drive means passing about a plurality of pulleys on said frame and at least one unidirectional clutch when driven by said drive means turns at least one of said pulleys;

said drive means including at least a length of cable, the ends of which are anchored to a sheave rotatably mounted to said tiller tube;

means for steering said vehicle in any position of the working cycle of said tiller tube;

means for moving said sheave along said tiller tube so as to go from a high-speed drive (level ride condition) to a low speed drive (hill climbing condition) and vice-versa; and

means for locking and unlocking said sheave in any position along said tiller tube.

4,437,678

VEHICULAR SUSPENSION

Barry J. Schultz, 738 Highbury Rd., Glen Waverley, Victoria 3150, Australia

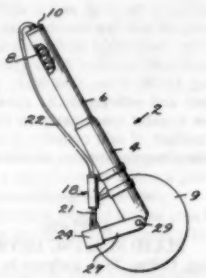
PCT No. PCT/AU81/00102, § 371 Date Mar. 31, 1982, § 102(e) Date Mar. 31, 1982, PCT Pub. No. WO82/00445, PCT Pub. Date Feb. 18, 1982

PCT Filed Jul. 31, 1981, Ser. No. 367,236

Claims priority, application Australia, Aug. 6, 1980, PE4905

Int. Cl.³ B62K *25/08*

U.S. Cl. 280—276 **11 Claims**



1. A vehicle comprising a chassis: at least one wheel; a suspension including a telescopic suspension strut having first and second members telescopically coupled together and a compression spring mounted to resiliently resist inwardly telescopic movement of said members, the first member being connected to the chassis and the second member having said wheel connected thereto for rotation relative thereto; disc brake means for applying braking torque to said wheel and comprising a disc mounted for rotation with said wheel and a disc brake caliper unit, said unit being mounted on an arm pivotally connected to the suspension strut at the axis of rotation of the wheel; and suspension adjustment means comprising a first hydraulic piston and cylinder unit coupled between the second member of the suspension strut and the caliper unit or arm and arranged to pressure hydraulic fluid in the first hydraulic piston and cylinder unit proportionately to the braking torque applied by said brake means to said wheel, said suspension adjustment means including a second hydraulic piston and cylinder unit which is operable to compress said spring only in response to increased pressure in said hydraulic fluid generated in response to braking torques being applied to said wheel, and wherein, when there is no braking torque applied by said brake means to said wheel, flexure of the suspension does not cause variations in the pressure of hydraulic fluid.

4,437,679

TUBE STRUCTURE FOR BICYCLE AND MOTORCYCLE FRAMES

Tullio Campagnolo, Via della Chimica, 36100 Vicenza, Italy

Filed Apr. 6, 1982, Ser. No. 365,910

Claims priority, application Italy, Apr. 15, 1981, 21177/81; Apr. 15, 1981, 21178/81; Jun. 19, 1981, 22435/81

Int. Cl.³ B62K *19/02*

U.S. Cl. 280—281 R **16 Claims**

1. Light and strong tube structure for frames of bicycles and motorcycles, said tube structure having a cross section having

a variable wall thickness wall, said structure being comprised by at least two interconnected layers of different materials, at

least one said layer being metallic and at least another said layer having a preferential direction of tensile strength.

4,437,680

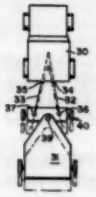
ADJUSTABLE TWO-BAR LINKAGE FOR A FOUR-WHEEL TRAILER

Leonard B. Della-Moretta, 1796 Russell Pl., Pomona, Calif. 91767

Division of Ser. No. 240,199, Mar. 3, 1981. This application Sep. 28, 1982, Ser. No. 425,566

Int. Cl.³ B62D *53/00*

U.S. Cl. 280—460 R **2 Claims**



1. A truck-trailer connection for connecting a four-wheel trailer having a center-pivoted front axle to a towing truck, including in combination:

a pair of generally coplanar links,

a first pair of spaced-apart swivel joints by moving them symmetrically inwardly or outwardly with respect to the truck's central fore-and-aft axis connecting said links to said trailer's front axle, said joints being equally spaced from the center pivot of that front axle, and

a second pair of spaced-apart swivel joints connecting said links to said truck, said second pair of joints being closer together than said first pair, and equidistant from the central fore-and-aft axis of said truck so that in a normal straight-ahead position of said truck and trailer, said links converge forwardly such that imaginary lines of extension of the links intersect a remote forward generally vertical instantaneous turning axis, and including

means associated with the swivel joints on the truck for adjusting the separation of those joints to provide selectively variable towing behavior and turning characteristics by control of the remote forward turning axis.

4,437,681

INFLATOR FOR A PROTECTIVE INFLATABLE CUSHION SYSTEM

Gary V. Adams, Brigham City, and Fred E. Schneiter, Ogden, both of Utah, assignors to Thiokol Corporation, Chicago, Ill.

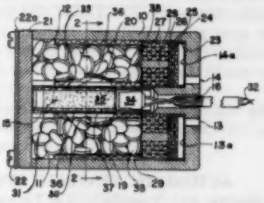
Continuation of Ser. No. 152,921, Jun. 3, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,210

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—733 **7 Claims**

1. A gas generator located on a support strap of a safety harness of a vehicle restraint within a safety cushion thereof for inflating said safety cushion, said gas generator comprising:

a body having the form of a thin, flat rectangular package and including plural side-by-side, elongated combustion chambers having longitudinal axes which lie in a common plane and extend substantially parallel to the sides of said rectangular package having the longer dimensions, each of said combustion chambers being filled with gas generating material and including filtering, cooling and pH-adjusting screens, said generator body further including



an igniter having a longitudinal axis and being commonly located with respect to and in communicating relation with at least two of said chambers, each of said chambers having an outlet formed in said generator body, said outlet being in direct communication with the interior of said cushion for inflating said cushion; and

ignition means for said igniter.

4,437,682

OUTRIGGER FOR USE IN WHEEL-TYPE VEHICLE

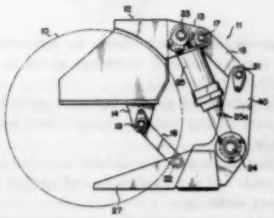
Masao Yokoyama; Masaharu Kon, and Hiroshi Ota, all of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,449

Claims priority, application Japan, Oct. 29, 1980, 55/153466

Int. Cl.³ E02F *3/75*

U.S. Cl. 280—764.1 **3 Claims**



1. An outrigger for use in a vehicle having wheels and an axle, comprising:

a support member fixedly secured to said axle;

a first link pivotally mounted at one end thereof to said support member;

a second link pivotally mounted at one end thereof to said support member, said first and second links being in parallel to each other;

an earth contacting member having a first section extending at right angles with the normal travelling direction of the vehicle just behind one of the wheels, a second section extending at right angles with said first section towards the front end of the vehicle along the inside of said one of the wheels and a third section projecting upwards from said first section;

the other end of said first link being pivotally connected to said earth contacting member at an upper end of said third section and the other end of said second link being pivotally connected to said earth contacing member; and

hydraulic cylinder means pivotally connected at one end

thereof to said support member and at the other end to said earth contactng member.

4,437,683

AUTOMATIC SEATBELT SYSTEM

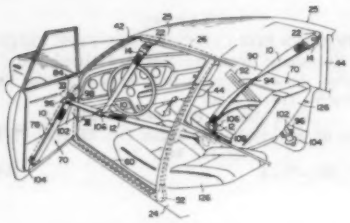
Shigeru Moriya; Akio Yoshida, both of Toyota; Yoshihiro Hayashi, Kasugai; Tatsushi Kubota, Okazaki, and Hiroshi Tsuge, Chiryu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Sep. 8, 1981, Ser. No. 300,069

Claims priority, application Japan, Sep. 9, 1980, 55-128214[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 6 Claims



1. An automatic seatbelt system for automatically fastening shoulder and lap seatbelt webbings about an occupant in a motor vehicle, comprising:

a shoulder guide rail substantially extending in a longitudinal direction of the vehicle along a roof side portion of a vehicle body;

a shoulder guide member slidably coupled with said shoulder guide rail and guiding an end portion of the shoulder seatbelt webbing;

a lap guide rail substantially extending in the longitudinal direction of the vehicle along an inner surface of a vehicle door;

a lap guide member slidably coupled with said lap guide rail and guiding an end portion of the lap seatbelt webbing;

a reversibly rotatable sprocket wheel fixed to the vehicle body;

a flexible tape having a plurality of openings along the longitudinal direction thereof and meshed with said sprocket wheel, said flexible tape extending continuously along the vehicle body at least from said shoulder guide member to said sprocket wheel and connected with said shoulder guide member at one end portion thereof; and

a flexible wire extending continuously along the vehicle body at least from an end of said flexible tape to said lap guide member and connected with the end of said flexible tape at one end thereof and said lap guide member at the other end thereof; said flexible wire being loosely connected with said flexible tape so that said flexible wire relatively moves with respect to said flexible tape for a predetermined distance.

4,437,684

AUTOMATIC SEATBELT SYSTEM

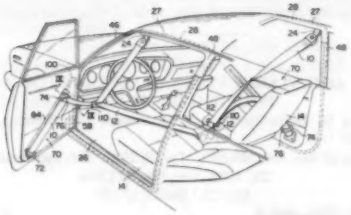
Shigeru Moriya; Akio Yoshida, both of Toyota; Muneharu Matsunami, Seto; Tatsushi Kubota, Okazaki; Hiroshi Tsuge, Chiryu, and Yuji Nishimura, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Seisakusho, Japan

Filed Oct. 8, 1981, Ser. No. 309,687

Claims priority, application Japan, Oct. 17, 1980, 55-147940[U]

Int. Cl.³ A62B *35/02*

U.S. Cl. 280—804 4 Claims



2. An automatic seatbelt system for automatically fastening shoulder and lap seatbelt webbings about an occupant in a motor vehicle, comprising:

a shoulder seatbelt webbing defined by an upper portion having a single outer webbing extending from a roof side portion to a rear lower portion of a door of the vehicle and a lap seatbelt webbing defined by a lower portion of said outer webbing;

a shoulder guide rail substantially extending in a longitudinal direction of the vehicle along the roof side portion of a vehicle body;

a shoulder guide member slidably coupled with said shoulder guide rail and guiding an end portion of the shoulder seatbelt webbing;

a lap guide rail substantially extending in the longitudinal direction of the vehicle along an inner surface of the vehicle door;

a lap guide member slidably coupled with said lap guide rail and guiding an end portion of the lap seatbelt webbing;

a first sprocket wheel fixed to the vehicle body;

a second sprocket wheel fixed to the vehicle body;

a single driving means for rotating said first and second sprocket wheels;

a flexible shoulder tape having a pluraility of openings along the longitudinal direction thereof, said shoulder tape being connected with said shoulder guide member and extending continuously along the vehicle body at least to said first sprocket wheel with which said shoulder tape is meshed; and

a flexible lap tape having a plurality of openings along the longitudinal direction thereof, said lap tape being connected with said lap guide member and extending continuously along the vehicle door and vehicle body at least to said second sprocket wheel with which said lap tape is meshed.

4,437,685

BOOK INDEX MARKERS

Jose Valencia, 3329 Amy St., Apt. #4, San Francisco, Calif. 94110

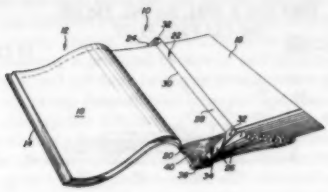
Filed Apr. 22, 1982, Ser. No. 371,000

Int. Cl.³ B42D *9/00*; B42F *21/00*

U.S. Cl. 281—42 5 Claims

1. An index marker in combination with a book, said book having categorized information compiled on the pages thereof in a known sequence, said index marker comprising a plurality

of sheets of material interleaved with the pages of the book and having a peripheral portion projecting beyond the pages of the book, said projecting portions including indicia corresponding with the sequence of categories on the pages of the book, said projecting portions being oriented in shingled relation to enable observation of the indicia and access to the projecting portions to facilitate opening the book to the desired page, and means removably securing the plurality of sheets to the book to enable easy assembly of the index marker with the book and removal therefrom for use with another book without damage



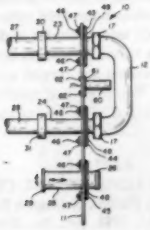
to the pages of the book or the index marker, said means securing the sheets and book in assembled relation including a fastener extending through projecting peripheral portions of the sheets adjacent each end of the spine of the book, and book spine engaging means connected with said fasteners, said spine engaging means including a right angle rigid member having one leg engaging the exterior of the spine of the book and the other leg including an eye engaging the fastener, each fastener including a telescopic screw threaded post assembly to rigidly clampingly engage the eye of the anchor.

4,437,686

ADJUSTABLE AND REPAIRABLE FLOW DIVERTER FOR FOOD PROCESSING EQUIPMENT

Clarence W. Wingate, Rochester, N.Y., assignor to Fluid Operations & Equipment, Inc., North Chili, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,496
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—12 **7 Claims**



1. An adjustable and repairable flow diverter for food processing equipment, said diverter including a mounting plate, supporting junctions for variable interconnection of pipes leading to said plate and a movable jumper connectable between said junctions at said plate for variably interconnecting said pipes, said diverter comprising:

a. said junctions being formed as coupler tubes mounted on said plate;

b. said coupler tubes having means at one end for connecting to said pipes;

c. said coupler tubes having means at another end for connecting to said jumper;

d. said plate having tube holes arranged to receive said coupler tubes;

e. said tube holes being larger than the outside diameter of said coupler tubes and large enough to allow said coupler tubes to be axially removed from and replaced in said plate;

f. each of said coupler tubes having an encircling collar;

g. said collars having outside diameters substantially larger than said tube holes;

h. studs secured to said collars at equiangular spacing around said collars to be parallel with the axes of said coupler tubes;

i. said plate having stud holes arranged at equiangular positions around said tube holes for receiving said collar studs;

j. said stud holes and said tube holes being large enough relative to said coupler tubes and said collar studs to allow eccentric, axial, and inclination adjustment of said coupler tubes relative to said plate; and

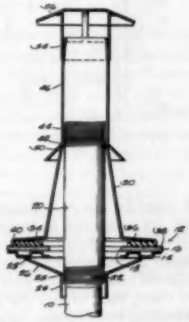
k. nuts on said studs securing said collars to said plates to hold said coupler tubes in an adjusted position for connection to said pipes and said jumper.

4,437,687

WATERPROOF ASSEMBLY OR SEALING AN APERTURE HOUSING A CONDUIT

James H. Wilson, 7225 W. Marine Dr., Milwaukee, Wis. 53223

Filed Nov. 24, 1980, Ser. No. 209,376
Int. Cl.³ E04B *5/48*
U.S. Cl. 285—42 **3 Claims**



2. Apparatus for providing an extension of an exhaust conduit of a building through an aperture in a roof of a building, the roof having upper and lower surfaces, and for providing a seal around the aperture and between the exhaust conduit and the upper surface of the roof to prevent access of moisture into the aperture, said apparatus comprising

an exhaust conduit extension having upper and lower ends, said upper and lower ends each including external threads, said conduit extension being comprised of sheet metal and being adapted to extend through the aperture, and said lower end of said conduit extension being adapted to be connected to said exhaust conduit of the building and for providing and extension of the exhaust conduit, through the aperture in the roof,

a restraining member threaded onto said lower end of said conduit extension, at least a portion of said restraining member engaging said lower surface of the roof,

a collar surrounding the upper end of said conduit extension, said collar including a peripheral edge,

a resilient seal adapted to surround said aperture and to be located between said peripheral edge of said collar and the upper surface of the roof, said resilient seal comprising a disc including a planar surface, and

means for forcing said peripheral edge of said collar against said planar surface of said resilient seal for providing a seal around said aperture, said means for forcing said collar against said resilient seal including a threaded member threadably supported on said upper end of said conduit extension and adapted to force said collar against said

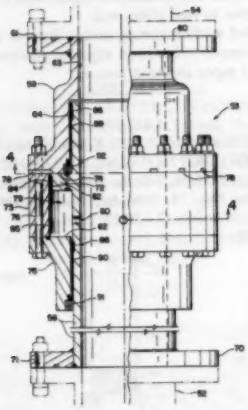
resilient seal and to force said resilient seal against the roof when said threaded member is threaded onto said upper end of said conduit extension.

4,437,688

RISER PIPE JOINT

James H. Kramer, Akron; Roy L. Orndorff, Jr., Kent, both of Ohio, and James M. Stephens, Grandview, Mo., assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,447
Int. Cl.³ F16L *17/00, 27/12*
U.S. Cl. 285—95 **2 Claims**



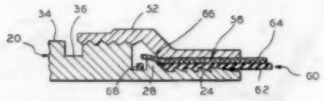
1. A universal joint for use in connecting a pair of axially spaced risers that are subjected to torsional twisting forces, each of said risers having a plurality of conduits, swivel means and slip joint means interconnecting conduits in one riser to conduits in an adjacent riser, said slip joint means being located off-center of said risers, each of said slip joint means having a longitudinally extending inner tubular member and a longitudinally extending outer tubular member, each of said tubular member having a flanged end for connection to adjacent conduits, an annular abutment on the intermediate portion of said longitudinally extending inner tubular member, said inner tubular member having a first circumferentially extending groove on the one end portion of said inner tubular member that is opposite said flanged end, a circumferential extending groove on the periphery of said annular abutment, said inner tubular member having a second circumferentially extending groove spaced between said abutment and said flanged end a distance from said abutment that is at least equal to the distance that said first groove is spaced from said abutment, an annular sealing member of elastically deformable material bonded to each of said grooves, each of said annular sealing members having an outer surface frictionally engaging an adjacent inner surface of said outer tubular member, said outer longitudinally extending tubular member having an enlarged intermediate portion that cooperates with said inner tubular member to define a chamber with axially spaced annular shoulders, said annular abutment of said inner tubular member received by said chamber and operative to selectively abuttingly engage said annular shoulders, the inner periphery of the end portion of said outer tubular member remote from said flanged end of said outer tubular member has a recessed portion to receive an annular seal that abuttingly and slidingly engages the outer periphery of said inner tubular member between said flanged end of the inner tubular member and said second circumferentially extending groove, said outer tubular member has a plurality of radially extending ports that interconnect said chamber with atmosphere via the external surface of said outer tubular member, and said inner tubular member having a plurality of circumferentially spaced radially extending ports between said abutment thereon and said second circumferentially extending grooves to interconnect said chamber with the internal bore of said inner tubular member.

4,437,689

REUSABLE END FITTING

Mark B. Goebel, Holyoke, and Kenneth E. Lefebvre, Hampden, both of Mass., assignors to Titeflex Corporation, Springfield, Mass.

Filed Apr. 3, 1981, Ser. No. 250,650
Int. Cl.³ F16L *33/22*
U.S. Cl. 285—246 **13 Claims**



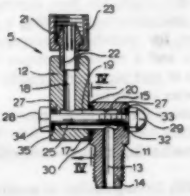
1. A two-piece end fitting comprising an elongated insert means having at least an annular barb on one end and a connector on the other end, said insert having a hose clamping barbed section between said barbed end and said connector end, said barbed section extending from the barbed end toward the connector end and terminating in an annular locking ridge with a shear surface, said locking ridge being followed by a first threaded section, collar means having a collar shell and a second threaded section with a sealing shoulder therebetween, said shoulder and said ridge cooperating to form an annular shearing edge when said first and second threaded sections are in a closed position, said barbed section having dimensions which receive and fit into a hose, said second threaded section having a length relative to the length of said barbed section such that when said first and second threaded sections mesh a hose fitted into said collar shell projects beyond said shell and over said shoulder whereby a pilot end section of said hose is formed, the relative dimensions of said insert means, collar means and hose being such that said collar shell pulls said pilot end over said barbed section as said first and second threaded sections are turned and close upon each other thereby shearing a tip ofsaid hose between said shoulder and said ridge which occurs responsive to the travel of said sections when said first and second threaded sections are turned upon each other, at which time said collar fits over and surrounds said barbed section with said end section of said hose therebetween.

4,437,690

HIGH PRESSURE HOSE SWIVEL CONNECTOR

Edwin H. Drath, 1218 S. Patton, Arlington Heights, Ill. 60005

Filed Sep. 23, 1981, Ser. No. 304,802
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—272 **3 Claims**



1. A high pressure hose swivel connector, comprising:
a pair of body members, each of which has a first and a second end;

each of said members having a respective blind end passage bore opening through its first end;

one of said members having means at its first end for connecting its bore with a high pressure source;

the other of said members having means at its first end for connecting its bore with a high pressure hose;

each of said members having adjacent to its second end a blind end cross port communicating with the inner end of the passage bore of the member and opening from a side face of the member;

said side faces being flat and slidably engaged in a common flat interface plane joint and with said cross ports concentrically aligned, so that a continuous high pressure passageway is provided by way of said bores and ports;

one of said side faces having an annular rabbet groove which opens into the associated cross port and also opens toward the opposite side face;

an O-ring pressure sealing ring mounted in said groove;

the dimensions of said O-ring and the dimensions of said groove being predetermined and corelated to assure that the O-ring will be under sealing compression when said faces are in slidable engagement but the inside diameter of the O-ring will remain free from obstructing said passageway through said ports;

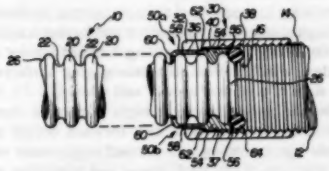
and a bolt having a shank of a smaller diameter than said ports and extending concentrically through said ports and through apertures through the blind ends of said ports, and said bolt acting to press said members together and said faces into swivelling sliding engagement and placing said O-ring under compression so as to maintain said interface plane joint free from pressure loss from said passage.

4,437,691

CONNECTOR FOR CORRUGATED TUBING

Ralph M. Laney, 6511 Marsol Rd. Bld.-6 Apt.-323, Mayfield Heights, Ohio 44124

Filed Jun. 1, 1981, Ser. No. 268,792
Int. Cl.³ F16L *17/00, 19/00, 19/08*
U.S. Cl. 285—353 **6 Claims**



1. A connector for connecting a corrugated tube to a threaded object such as a pipe or a fitting without requiring modification of the ends of the tube, comprising:

a ferrule surrounding the tube at the endmost corrugations of the tube, the ferrule engaging the corrugations such that relative axial movement between the ferrule and the tube is not possible;

a nut disposed about the tube and having portions engageable with the ferrule, the ferrule being disposed intermediate the ferrule-engaging portions of the nut and the object to which the tube is to be secured; and

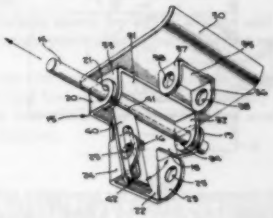
a sealing member disposed within the nut and adjacent the end of the tube, whereby the sealing member will be compressed in use between the end of the object and the ferrule to establish a fluid-tight seal.

4,437,692

PROTECTIVE HASP FOR PADLOCK

David Halopoff, Los Angeles, Calif., assignor to Holmes-Hally Industries, Los Angeles, Calif.

Continuation-in-part of Ser. No. 158,827, Jun. 12, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,240
Int. Cl.³ E05C *5/02*
U.S. Cl. 292—57 **6 Claims**

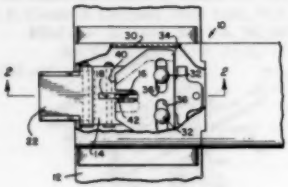


1. A protective hasp for a padlock and its shackle comprising a back plate having fastening means therein, a cover plate spaced from the back plate when in a closed position and forming a space therebetween, and a pair of laterally spaced pivot tabs having captive ends on adjacent faces of each plate mounted so that the tabs of one pair lie adjacent respective tabs of the other pair forming sets of adjacent pivot tabs on respective opposite sides of the hasp with free ends of pivot tabs on one plate in close proximity to the opposite plate and within said space between the plates, axially aligned pivot holes in the pivot tabs substantially midway between opposite ends of respective tabs, and a latch bolt slidably mounted in the pivot holes whereby to pivotally assemble said plates so that adjacent faces of the respective plates face each other in locked position, said latch bolt having a slidable locking thrust between extending locked position on one side of said hasp and a withdrawn position from said side of said hasp, a pair of spaced locking tabs of substantially the same height as the pivot tabs on the adjacent face of each plate mounted so that the locking tabs of one pair lie adjacent respective locking tabs of the other pair forming laterally spaced sets of adjacent locking tabs with shackle holes in each set of locking tabs in substantial alignment, each set of locking tabs being receptive of a padlock shackle at a location spaced inwardly from side edges of the cover plate, free ends of locking tabs on one plate being in close proximity to the opposite plate when the cover plate is in locked position, said shackle holes being substantially midway between opposite ends of the respective tabs, said cover plate having one edge portion extending beyond and covering said pivot tabs, that portion of said cover plate adjacent one of said edge portions extending beyond and covering said locking tabs and adapted to cover the padlock shackle and substantially cover the padlock body when said padlock is engaged with either set of locking tabs, a transverse projection on the latch bolt intermediate opposite ends and mounted within the space between said sets of pivot tabs, said projection in respective extended and withdrawn positions of the latch bolt having a position adjacent the respective set of pivot tabs, said projection having a slot therein for reception of the sets of adjacent locking tabs whereby upon reception of the padlock shackle the latch bolt is locked in either extended or withdrawn position with the projection beneath the padlock shackle and the cover plate is simultaneously locked to the back plate in a position of protection for said padlock.

4,437,693
THERMALLY RESPONSIVE LATCHING DEVICE AND METHOD OF MODIFYING A LATCHING DEVICE

Maksimilijan Godec, Indianapolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed May 13, 1981, Ser. No. 263,110
Int. Cl.³ E05C 1/02, 15/02; E05F 15/20
U.S. Cl. 292—191 11 Claims



1. Thermally-responsive means for preventing unlatching of a latching and unlatching device for a door, bulkhead, latch or the like, in combination with such a device having a base, and latch means, coupled to said base and movable, relative to said base, along a pathway between a first, latching position, and a second, unlatching position, wherein said thermally-responsive means comprises:

a plate, slidably coupled to said base, in adjacency to said latch means, for free, slidable movement thereof, in first and second opposite directions, (a) gravitationally and obstructively into traverse of said pathway, for preventing movement of said latch means fully along said pathway, and (b) counter-gravitationally out of traverse of said pathway, for permitting movement of said latch means fully along said pathway; wherein

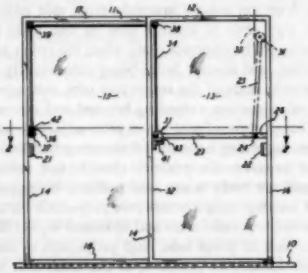
said plate has side edges on opposite sides thereof; and

retainer means, coupled to said base, (a) having surfaces which obstruct said side edges and, consequently, prevent movement of said plate, in either of said first and second opposite directions, into traverse of said pathway and, responsive to exposure of said retainer means to a given temperature, (b) for releasing said, plate whereby the latter is free to move gravitationally and obstructively, as aforesaid, into traverse of said pathway.

4,437,694
SLIDING DOOR WITH SECURITY APPARATUS

Renaldo C. Lillo, 4415 Wright Ave., Racine, Wis. 53405

Filed Mar. 1, 1982, Ser. No. 353,845
Int. Cl.³ E05C 3/04
U.S. Cl. 292—235 6 Claims

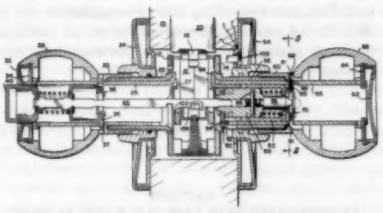


1. A sliding door with security apparatus, comprising a sliding door track, a sliding door panel slidably mounted on said track in the longitudinal plane of said track, an upright member spaced from said sliding panel and on said longitudinal plane, a security bar hingedly mounted on said upright member and extending toward said sliding panel and with the hinge axis being in the path of sliding movement of said sliding panel and being horizontal for swinging movement of said bar in said plane, a roller rotatably mounted on the extending end of said bar and being located in rolling contact with said sliding panel for rolling along said sliding panel when said sliding panel is moved toward and away from said security bar while said security bar is undergoing its swinging movement, and a stop mounted on said sliding panel in the path of movement of said roller and at an elevation relative to the elevation of said hinge axis to upwardly support said security bar in a downwardly swung and thereby secured position for restraining said sliding panel against said sliding movement.

4,437,695
KNOB RETAINER BLOCKER MECHANISM

William R. Fosbee, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed Jan. 8, 1982, Ser. No. 338,091
Int. Cl.³ E05C 21/00
U.S. Cl. 292—352 13 Claims



1. Knob retainer-blocking mechanism for a lock set having inside lock set mechanism and having an

outside knob mounted on a knob sleeve, comprising

an outside knob retainer movable transversely of the sleeve between a forward knob-retaining position and a rearward knob-release position,

said retainer being in the form of a plate mounted for diametrical sliding movement in said sleeve and having a central opening including a thrust-receiving forward border and side borders which define blocker-engaging surfaces at opposite sides of a central area of said opening,

a retainer biasing spring having a bight portion in thrust-transmitting engagement with said forward border and having side legs extending into stressed engagement with opposite portions of the knob sleeve and straddling said central area of the retainer plate opening,

a blocking plunger mounted for movement axially within the knob sleeve between a blocking position in which it extends through the central area of said retainer plate opening in blocking relation with said blocker engaging surfaces so as to block movement of the knob retainer from its knob-retaining position to its knob-release position and a non-blocking position in which it is withdrawn from said opening and permits such retainer movement, and

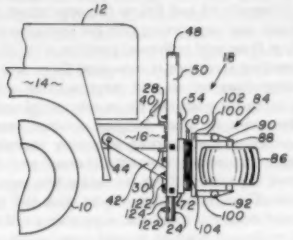
plunger control means for positioning said plunger in its blocking position when the lock set is installed in a door and is conditioned to prevent lock bolt retraction by the outside knob, said control means being inaccessible from the outside of the door when the door is closed, and said plunger being releasable to its non-blocking position in response to manipulation of the inside lock set mechanism.

4,437,696

MOVABLE TRUCK BUMPER

Gerald J. Straub, 6969 Madden Rd., Dexter, Mich. 48130

Filed Oct. 9, 1981, Ser. No. 309,929
Int. Cl.³ B60R *19/04*
U.S. Cl. 293—118 11 Claims



1. A vertically moveable bumper comprising a lift base rigidly attachable to a vehicle frame, said lift base substantially vertical in orientation,

a vertically moveable lift frame substantially vertical in orientation mounted on said lift base,

a first set of guide means providing fore and aft positioning of the lift frame relative to the lift base,

said first set of guide means comprising pads located between said lift frame and said lift base to accept fore and aft compressive loading therebetween during pushing engagement of the bumper and to provide sliding frictional engagement in unloaded condition, and rollers to retain said lift frame and lift base in said sliding frictional engagement, said rollers being unloaded during compressive fore and aft loading of the pads,

a second set of guide means providing lateral positioning of the lift frame relative to the lift base,

energizable means connecting said lift base to said lift frame and adapted to raise said lift frame relative to said lift base, and,

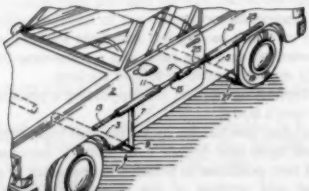
remote control means operable to actuate said energizable means from within cab of said vehicle.

4,437,697

RETRACTABLE AUTOMOBILE SIDEGUARD

Paul R. Hinojos, 1302 W. Amelia, Phoenix, Ariz. 85009

Filed Aug. 19, 1982, Ser. No. 409,656
Int. Cl.³ B60R *19/00*
U.S. Cl. 293—118 12 Claims



1. A retractable side guard assembly for use on an automobile to protect door panels or the like, said assembly comprising in combination:

a. a first assembly including a first tubular housing for rigid attachment to the bottom of a first automobile approximately perpendicularly to the plane of a side of said first automobile, said first tubular housing having an open outer end;

b. a first arm telescopically disposed in said first tubular housing, said first arm having a first and a second end;

c. first pivot means movably disposed in said first tubular housing for pivotally connecting said first end of said first arm to said first tubular housing and permitting said first arm to be extended out of said open outer end of said first tubular housing and then pivoted upward to an upright position;

d. first locking means for rigidly locking said first arm into said upright position relative to said first tubular housing; and

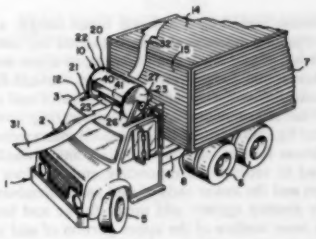
e. a second arm having a first end connected to said second end of said first arm for extending laterally along the side of said first automobile when said first arm is in said upright position.

4,437,698

FUEL SAVING DEVICE FOR INCREASING FUEL MILEAGE ON A MOVING VEHICLE

Anthony T. Tantalo, Apt. 4 43 Portland Pkwy., Rochester, N.Y. 14621

Filed Aug. 9, 1982, Ser. No. 406,489
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S 10 Claims



1. a fuel saving device for increasing fuel mileage on a moving vehicle comprising:

(a) a housing mounted on top of said moving vehicle,

(i) said housing having an air intake opening at the front of said housing and an exhaust opening at the rear of said housing for the flow of air therethrough,

(b) a motor driven rotor disposed within said housing and positioned in cooperative relationship with said air intake opening and exhaust opening of said housing so that said rotor rotates at various rotational speeds in response to a forward wind pressure generated when said vehicle is moving in a forward direction, and

(c) rotor drive means for rotating said rotor at a greater speed than said various rotational speeds to decrease said forward wind pressure at said intake opening of said housing.

4,437,699

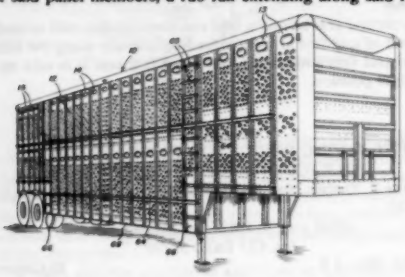
MONOCOQUE TRAILER OR BODY SIDE CONSTRUCTION

Mack A. Lewis, Sioux City, Iowa, and Mike R. Spencer, Hubbard, Nebr., assignors to Wilson Trailer Co., Sioux City, Iowa

Filed Nov. 16, 1981, Ser. No. 321,554
Int. Cl.³ B62D *33/04*
U.S. Cl. 296—181 9 Claims

1. A monocoque body wall having a horizontal length and a vertical height, said wall including a plurality of elongated upstanding panel members having upstanding opposite side marginal strips, said panel members being spaced along said wall and including adjacent laterally overlapping longitudinal side marginal strips, one side marginal strip of each pair of

overlapped side marginal strips being generally planar and the other marginal strip of each pair of overlapped side marginal strips being slightly laterally offset to one side of the corresponding panel member and including laterally spaced generally coplanar opposite longitudinal marginal border portions and a longitudinally extending central channel portion disposed between and formed integrally with said border portions, said channel portions opening toward said one marginal strip, and securing means securing at least longitudinally spaced portions of each of said border portions to corresponding portions of said one overlapped strip, said wall including a lower longitudinal marginal portion defined by the lower ends of said panel members, a rub rail extending along said lower



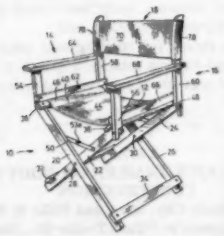
marginal portion including a vertical outer flange, a lower inwardly projecting horizontal flange carried by the lower marginal portion of said verticl outer flange, an upper inwardly projecting horizontal flange carried by said vertical flange a spaced distance below the upper marginal edge of said vertical flange, and an intermediate inwardly projecting horizontal flange carried by said vertical flange spaced intermediate said upper and lower flanges, said intermediate and lower flanges being adapted to receive corresponding ends of floor beams therebetween and the lower ends of said panel members being downwardly abutted against said upper flange and being secured to the inner surface of the upper portion of said vertical flange disposed above said intermediate flange.

4,437,700

COLLAPSIBLE OR FOLDING CHAIR

John T. Elaschuk, 39 Geoffrey St., Toronto, Ontario, Canada M6R 1P2

Filed Jul. 16, 1981, Ser. No. 284,131
Int. Cl.³ A47C 4/28
U.S. Cl. 297—45 **7 Claims**



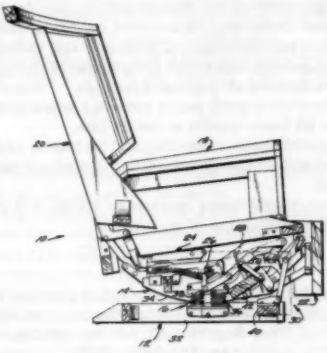
1. In a collapsible chair including a front pair and rear pair of crossed, pivotally interconnected legs having a common pivot axis extending from front to rear, a seat-supporting rail extending between said pairs of legs front to rear at each side with each such seat-supporting rails secured to the uppermost portion of each leg and inwardly thereof and in substantially parallel relation to one another for swinging movement with said legs about said pivot axis from a collapsed position in which said seat-supporting rails are in substantial side-by-side relation to an erect position in which said seat-supporting rails are spaced apart in chair-defining relation, and reversely, a unitary armrest and backrest supporting structure extending between said pairs of legs front to rear at each side, pivot means pivotally securing each said unitary supporting structure to the uppermost portion of each respective leg only, on an axis located outwardly of and below the uppermost extent of the adjacent inner seat-supporting rails for swinging movement upon said legs from said collapsed position wherein each said unitary supporting structure is separated from said adjacent inner seat-supporting rail to said erect position wherein each said unitary supporting structure is in substantial upstanding abutment therewith in chair-defining relation, and reversely, each said unitary supporting structure including a reinforcing member projecting inwardly thereof and therealong and so upwardly spaced from its said pivot axis as to move into and out of overlying engagement with the uppermost surface of said adjacent inner seat-supporting rail when swung from said collapsed position to said erect position and reversely.

4,437,701

ROCKER-BLOCKING DEVICE FOR ROCKING CHAIR HAVING PROJECTABLE/RECTRACTABLE FOOTREST

Ned W. Mizelle, High Point, N.C., assignor to The Lane Company, Altavista, Va.

Filed Oct. 13, 1981, Ser. No. 310,727
Int. Cl.³ A47C 1/02
U.S. Cl. 297—85 **31 Claims**



1. For use on a motion chair, which includes:
a base having longitudinal left and right side rails and a transverse front rail;
a rocking portion including:
a rocker cam unit having left and right rockers rockably supported on said side rails, and a transverse front rail fixedly mounted relative to said rockers;
a body-supporting portion for supporting a portion of the chair-user's body;
a motion chair mechanism mounting said body supporting portion upon said rocker cam unit for movement between two positions in which the character of support offered said portion of the chair-user's body differs substantially so as to provide a sense of greater control in one of said positions so that the ability of the rocking portion to rock is desired, and so as to provide a sense of lesser control in the other of said positions so that the ability of the rocking portion to rock is not desired; and
means associated with said motion chair mechanism for selectively moving said body-supporting portion to, from and between said positions of greater and lesser control by operating said motion chair mechanism, this

selectively moving means including a transversally extending torque bar which is rotated about its own longitudinal axis clockwise and counterclockwise through an arc in order to operate said motion chair mechanism,

a rocker-blocking device, comprising:

a first generally longitudinally extending train of pivotally connected links having one end adapted to be pivotally secured to the rocker cam unit and another end adapted to be pivotally secured to said torque bar, so that as said torque bar is rotated in the angular sense which causes said body-supporting portion to be moved to said position of greater control said first train of pivotally connected links is toggled about said torque bar and as said torque bar is rotated in the angular sense which causes said body-supporting portion to be moved to said position of lesser control said first train of pivotally connected links is de-toggled from about said torque bar;

said first train of pivotally connected links including means defining a longitudinally elongated slot having an upper/-rear end and a lower/front end; and

a second generally longitudinally extending train of pivotally connected links, having one end adapted to be pivotally secured to said base and another end adapted to be pivotally secured to the rocker cam unit, relative to the rear of said one end of the first train of pivotally connected links, with the first and second trains of pivotally connected links crossing past one another between their respective ends;

said second train of pivotally connected links including means defining a longitudinally elongated wedge element which has upper and lower edges which converge toward one another rearwardly of said wedge element so that said wedge element is taller toward the front of the chair and shorter toward the rear of the chair;

said wedge element being disposed through said slot means so that a variably, located, longitudinally short band of said wedge element lies within said slot means;

the dimensions and spatial orientations of said wedge element and said slot being such that when said first train of links is toggled about said torque bar by operation of said selectively moving means, the band of said wedge element which lies within said slot means is located toward the rear of the chair and is so short and so centrally disposed relative to the length of the slot, that said rocking portion of the chair is free to be rocked on said base and when said first train of links is de-toggled from about said torque bar by operation of said selectively moving means, the band of said wedge element which lies within said slot means is located toward the front of the chair and is so tall that its upper and lower edges are in contact with the upper/rear and lower/front ends of the slot means, respectively, and said first and second trains of links, together, thus, constitute a substantially rigid, longitudinally aligned strut which is active both in tension and compression between the rocker cam unit and the base to prevent rocking of the rocking portion of the chair upon the base.

4,437,702

ADJUSTABLE PATIENT CORRECTIVE SUPPORT APPARATUS

A. Richard Agosta, 45-49 218th St., Bayside, N.Y. 11361

Filed Apr. 6, 1981, Ser. No. 251,280
Int. Cl.³ A47C *3/00*
U.S. Cl. 297—284 **7 Claims**

1. An adjustable, patient corrective, support comprising:

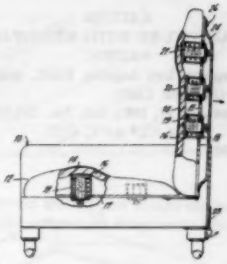
(a) a resilient body receiving member;

(b) at least one rigid supporting panel spaced from said body receiving member;

(c) a plurality of spaced spring members secured at one end to the rigid panel and extending into the space between the rigid supporting panel and the body receiving member;

(d) at least one pair of opposed spaced elongated flexible straps extending over and coupled to the free ends of the spring members;

(e) slots in the rigid panel adjacent each of the spring members to receive the free ends of the flexible straps therethrough; and



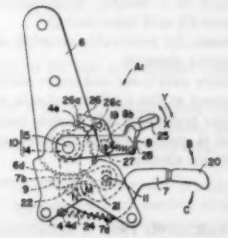
(f) fastening means, carried by the rigid panel to secure the four ends of said at least one pair of straps in any desired position along their length and individually dispose the free ends of the springs at any one of a wide number of angles with respect to the plane of the rigid panel.

4,437,703

SEAT BACK RECLINING MECHANISM

Tsutomu Nishikori, and Yasuo Yoshiki, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd. and Delta Kogyo Co., Ltd., both of Hiroshima, Japan

Filed Sep. 18, 1981, Ser. No. 303,513
Claims priority, application Japan, Sep. 20, 1980, 55-131379
Int. Cl.³ A47C *1/024*; E05D *11/10*
U.S. Cl. 297—362 **9 Claims**



1. A seat back reclining mechanism for a car seat including a seat bottom and a seat back which is connected with the seat bottom for adjustment in an inclination angle with respect to the seat bottom, said reclining mechanism including stationary bracket means attached to said seat bottom, movable bracket means attached to said seat back and connected pivotably with said stationary bracket means, lock plate means movably connected with said stationary bracket means and having first gear teeth means, said movable bracket means having second gear teeth means, coarse, adjusting means for actuating said lock plate means so that said first gear teeth means is engaged with said second gear teeth means to thereby effect coarse adjustment of inclination angle of said movable bracket means, adjusting movement producing means for producing a seat back inclination angle changing movement, fine adjusting means for operating said adjusting movement producing means to effect fine adjustment of the inclination angle of said seat back, locking means for locking said adjusting movement producing means, interconnecting means for interconnecting the locking means with the fine adjusting means so that said locking means is actuated through said fine adjusting means to unlock said

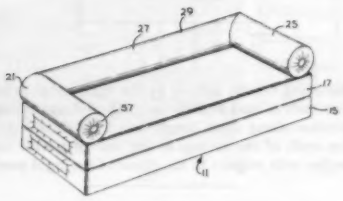
adjusting movement producing means when said fine adjusting means is actuated in one direction to thereby allow movement of the adjusting movement producing means whereby the inclination angle of the seat back can be adjusted through operation of the fine adjusting means in said one direction.

4,437,704

MODULAR FURNITURE WITH REMOVABLE OUTER FABRIC

Vigen M. Hovsepians, Los Angeles, Calif., assignor to Vivar, Incorporated, Glendale, Calif.

Filed Jul. 17, 1981, Ser. No. 284,408
Int. Cl.³ A47C 4/02
U.S. Cl. 297—440 **8 Claims**



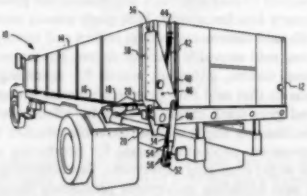
1. An item of furniture comprising:
(a) at least one integral, contoured interior element;
(b) an inner lining disposed in contacting relationship with and substantially covering said interior element, said inner lining comprised of a material, having a relatively low coefficient of friction and which, when under tension, is capable of stretching approximately twice in each of its length and width dimensions as when not under tension;
(c) a readily removable and replaceable outer material disposed in a slidable relationship with and substantially covering said inner lining;
(d) means for removably securing said outer material to said interior element,
whereby said inner and outer materials fit conformly with respect to the contours of said interior element and said outer material is able to slide easily over said inner lining, and is readily removable from and replaceable over said interior element.

4,437,705

SELF-LOCKING TRUCK SIDEBOARD LIFT AND DUMP MECHANISM

George J. Heberlein, 1701-33rd Ave., Greenley, Colo. 80632

Continuation-in-part of Ser. No. 66,939, Apr. 4, 1980, abandoned. This application Oct. 28, 1981, Ser. No. 315,613
Int. Cl.³ B60P 1/26
U.S. Cl. 298—1 R **2 Claims**



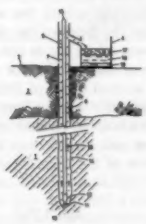
1. A self-locking truck sideboard lift and dump mechanism for use with a truck box having a bed portion, front and rear end members, and at least one sideboard pivotally mounted along a longitudinal edge thereof to the bed portion for movement between a raised or closed position and a depending or open position, said mechanism comprising:
a rotatable shaft mounted against said rear end member and inwardly of and longitudinally parallel to said longitudinal edge of said sideboard and beneath said bed portion of the truck box, a rear end of said rotatable shaft extending outside said rear end member of the truck box;
front and rear bell crank levers mounted to front and rear ends, respectively, of said rotatable shaft;
bracket means mounted adjacent a rear end of said sideboard and having a plate surface substantially parallel to said rear end member and extending inwardly of said longitudinal edge and outside said rear end member;
a linkage arm pivotally connected between a depending end of said rear bell crank lever and a point on said plate surface of said bracket means such that the longitudinal center line of said linkage arm lies outside the longitudinal axis of said rotatable shaft when said sideboard is in the raised or closed position; and
hydraulic cylinder means articulately mounted at an end thereof below said bed portion of the truck box and adjacent the front end of said rotatable shaft, said hydraulic cylinder means having a piston end articulately coupled to said front bell crank lever for imparting rotational motion to said rotational shaft;
said rear bell crank lever having stop means mounted thereon for stopping rotation of said rotatable shaft, in a sideboard closing direction, at a position wherein the longitudinal center line of said linkage arm lies outside the longitudinal axis of said rotatable shaft.

4,437,706

HYDRAULIC MINING OF TAR SANDS WITH SUBMERGED JET EROSION

Herbert S. Johnson, Oakville, Canada, assignor to Gulf Canada Limited, Toronto, Canada

Filed Aug. 3, 1981, Ser. No. 289,333
Int. Cl.³ E21C 41/10
U.S. Cl. 299—7 **22 Claims**



1. A method of recovering bitumen from unconsolidated bitumen-bearing formations including tar sands, comprising:
(a) introducing into said formation at least one nozzle projecting at least one jet of aqueous hydraulic mining fluid at high velocity through a liquid medium towards said formation, said jet having a forward component;
(b) bringing said nozzle into proximity with said formation, said jet impinging thereon with sufficient velocity to erode said formation and substantially separate said bitumen from other constituents of said formation;
(c) advancing said nozzle towards said formation as it erodes to separate further quantities of bitumen; and
(d) recovering said separated bitumen.

4,437,707

SPRAYING NOZZLE ARRANGEMENT

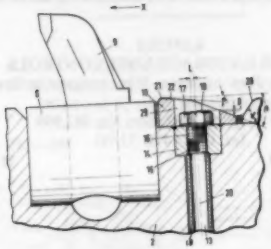
Gerd Best, Sprockhövel, and Günter Dlugosch, Bönen, both of Fed. Rep. of Germany, assignors to Krampe & Co. Fertigung in Bergbaubedarf GmbH, Hamm, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,722

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128049

Int. Cl.³ E21C 35/22

U.S. Cl. 299—81 13 Claims



1. A spraying nozzle arrangement for a cutting roller for use in a mining machine and rotatable in a pre-determined direction, the cutting roller having at least one cutting member having a periphery and provided with at least one cutting bit, the arrangement being mounted on said cutting member in the vicinity of the associated cutting bit and comprising a spraying nozzle having a central axis; and a nozzle shield enclosing said spraying nozzle and mounted coaxially therewith and having an upper face facing outwardly of said nozzle, said upper face tapering in a direction opposite to said pre-determined direction starting from the periphery of the cutting member and extending to the region located below said upper face, said nozzle shield having in said predetermined direction a stream-like shape and defining said predetermined direction a front portion facing towards said cutting bit, said front portion being of a wedge-shape and terminated at its end facing said cutting bit with a rounded surface, wherein said upper face tapers in such a fashion that it forms a first portion sloping from said periphery at a first angle, and a second portion sloping from the end of said first portion at a second angle relatively larger than said first angle.

4,437,708

CUTTING DEVICES FOR MINING AND TUNNELLING MACHINES

Wilhelm Stoltefuss, Kamen-Heeren-Werve, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

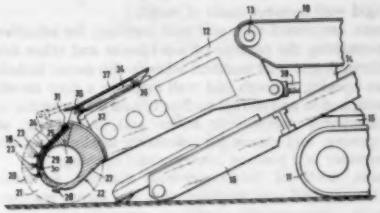
Filed Aug. 3, 1982, Ser. No. 404,734

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133956

Int. Cl.³ E21C 35/22

U.S. Cl. 299—81 9 Claims

1. A cutting device comprising in combination, a rotatable roller equipped with cutters and a plurality of water spray nozzles carried by support means which does not rotate with



the roller, wherein the support means comprises at least one narrow plate-like component fitted into a groove in the roller.

4,437,709

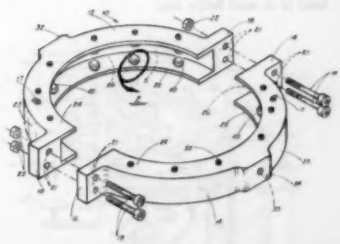
YOKE APPARATUS

Noel Linderman, 227 S. Locust St., McComb, Miss. 39648

Filed Mar. 30, 1981, Ser. No. 248,943

Int. Cl.³ F16C 19/50, 19/10

U.S. Cl. 308—219 4 Claims



1. A yoke collar apparatus for use with splined couplings, comprising:

a. a substantially circular yoke body, having a first U-shaped half section and a second U-shaped half section, said first and second U-shaped half sections connectable to one another;

b. a pair of parallel edge portions integrally connected in perpendicular relationship to the back portion of each of said U-shaped sections, said pair of edge portions and said back portion defining an open ended continuous circular channel means within said yoke body;

c. a plurality of roller bearing means, each individually mounted in equally spaced openings on the inner surface in said edge portions and extending into said channel means for engaging a rotatable body within said channel, providing a substantially frictionless surface between said rotatable body and said bearing means, each bearing means of one edge portion being positioned opposite a bearing means of the second edge portion.

4,437,710

INFLATABLE, INERT GAS-PURGED, WELDING CHAMBER

James M. MacFarland, Frederica, and Bernard W. Kappe, Camden, both of Del., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 18, 1981, Ser. No. 264,930

Int. Cl.³ B23K 20/00, 35/38; A62B 15/00

U.S. Cl. 312—1 6 Claims

1. A welding chamber assembly for welding workpieces,

made of a metal which is susceptible to atmospheric contamination during welding, in an air-free, inert gas environment, said welding chamber assembly comprising:

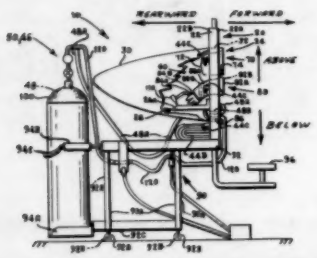
a. a wall subassembly which includes:

a rigid wall member made of metal;

means, associated with said wall member, for selectively permitting the passage of workpieces and other items through said wall member, wherein this means includes: an opening through said wall member; a door member attached to an external surface of said wall member and selectively movable to cover, and to uncover, said opening; and means for releasably holding said door member in a position covering said opening;

means, made of fluid-impervious material, for seeing through said wall member, with this means associated with said means for selectively permitting the passage of workpieces and other items through said wall member, wherein said means for seeing through said wall member includes an opening through said door member with a window and a welding lens in said opening;

means, associated with said wall member, for permitting manipulation and welding of said workpieces, wherein this means includes: at least two port holes in said wall member; a glove made of fluid-impervious material connected to each said port hole, with each glove selectively positionable forwardly of, or rearwardly of, said wall member; and a hole in said wall member for a lead of a welding torch, with said hole configurated, dimensioned, and sealed, such that it is fluid-tight when said lead is in said hole; and



means, associated with said wall member, for supporting said workpieces and other items passed through said wall member, wherein this support means includes a metal shelf which is attached to a rear surface of said wall member, which extends rearwardly therefrom, and which is disposed below said means for permitting the passage of workpieces and other items through said wall member;

b. a collapsible member, which comprises a translucent reusable bag made of fluid-impervious material, releasably attached to a flange located on the rear surface of said wall member, with said collapsible member and said wall subassembly defining a fluid-impervious welding chamber which houses said means for supporting said workpieces and other items passed through said wall member and which also houses said means for permitting manipulation and welding of said workpieces;

c. means, associated with said fluid-impervious welding chamber, wherein this means includes: means, including an air suction device, for attaining a partial vacuum in communication with said collapsible member, whereby said member is thereby collapsed; means for removably loading and releasably binding said collapsed member, wherein this means includes: padding disposed on, and selectively around, said collapsed member; a plurality of hooks fixedly attached to said wall member, and a cord releasably engaged to said hooks and disposed such as to criss-cross and be in contact with said padding and said collapsed member; and means for purging any air remaining in said partially air-evacuated, removably loaded, and releasably bound, collapsed member, wherein this air purging means includes a source of inert purging gas in communication with said collapsed member;

d. means, associated with said fluid-impervious welding chamber, for introducing inert gas into said chamber to replace said air evacuated from said chamber; and

e. means for supporting said wall subassembly, said collapsed member, said means for introducing inert gas into said chamber, and a source of inert gas for use in welding.

4,437,711

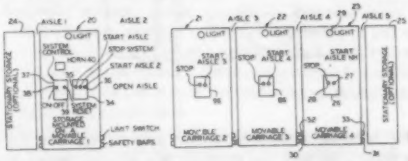
MOVABLE STORAGE UNIT CONTROLS

Dean L. Dahnert, Fort Atkinson, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed May 28, 1982, Ser. No. 382,999

Int. Cl.³ A47B 53/00

U.S. Cl. 312—201 **11 Claims**



1. Storage apparatus comprising:

a series of storage units at least some of which have storage faces and some of which are selectively movable for creating an aisle between a pair of units for access to the faces of the separated storage units,

guide means for guiding said units in a direction normal to said storage faces,

reversible motor driven means mounted on respective units for driving the unit selectively in one direction or the other and a controller for each motor responsive to alternate control signals by energizing and determining the driving direction of the motor,

a plurality of structurally similar programmable control modules at least one of which is mounted on each movable storage unit and one of which acts as a system controller (SC) module, each of said modules including digital processor means,

at least one limit position sensing means on each storage unit which means is in an operated state when it is in proximity with any of an adjacent movable unit or a stationary unit and is in an unoperated state when spaced from any of said units,

at least one manual start switch mounted on each movable storage unit for selection of the desired access aisle,

first circuit means for transmitting resync pulses, generated by the processor means in said SC module with a constant interval between them, to the processor means in the other control modules simultaneously,

second circuit means interconnecting said modules for transmitting serial data bits out of said SC module and from one control module on a storage unit to the next one,

third circuit means interconnecting said control modules for transmitting serial data bits from module to module and into said SC module,

the processor means in each control module on a movable storage unit responding to receipt of a resync pulse by initiating definition of a sequence of time slots in each of which a bit can be transmitted,

the processor means in the control module of the storage unit whose start switch has been operated responding to operation by causing the bits for a digital code word corresponding to the numerical identification of the unit to be transmitted serially to said SC module in successive time slots while said start switch is being operated and the

processor means responding to occurrence of valid identification by transmitting said identification code word to each of the control modules on the movable units for the processor means on the unit to compare said code word with its own identification code to determine the direction in which its storage unit should move,

the processor means sensing that its limit position sensing means is unoperated responding by causing the one of said alternate control signals to be applied to said motor controller that causes said storage unit to be driven until the limit sensing means on said unit is operated.

4,437,712

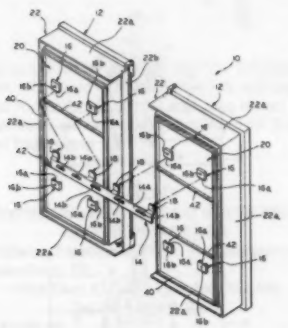
CABINET SYSTEM

John W. Wissinger, 239 Mitchell Rd., New Castle, Pa. 16105

Filed Jul. 9, 1981, Ser. No. 281,543

Int. Cl.³ A47B *67/02*

U.S. Cl. 312—246 **14 Claims**



1. A modular wall mounted cabinet system, comprising:

a mounting bracket adapted to be secured to a wall; and

at least two cabinet units adapted to be supported by said bracket;

said cabinet units and mounting bracket having complementarily engageable hanger means, said hanger means being adapted to support each of said cabinet units in either of two distinct orientations, said cabinet units being supported by said hanger means in side-by-side relation, said distinct orientations for said cabinet units being inverted positions, said hanger means including oppositely facing slot means on each of said cabinet units and tab means on said mounting bracket, said tab means being selectively engageable with said slot means to support each of said cabinet units in either of said inverted positions.

4,437,713

TREE ORNAMENT CONTAINER

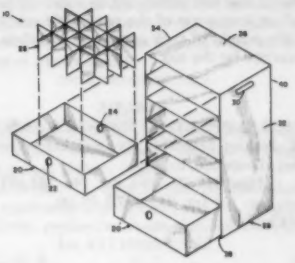
Bobbie R. Roach, 621 Dunwich Way, Baltimore, Md. 21221

Filed Dec. 30, 1981, Ser. No. 335,704

Int. Cl.³ A47B *43/00*; **B65D** *5/22*

U.S. Cl. 312—259 **1 Claim**

1. In a Christmas tree ornament container of corrugated paper board having an opensided box with a plurality of shelves therein for holding drawers, and a plurality of said drawers having Christmas tree ornament separators therein, each said drawer having a plurality of tabs, fold-up sides and fold-up ends held by insertion of tabs in slots, each of said fold-up sides and fold-up ends being a double part, with a fold line between each of the double-parts of the sides and of the ends, a respective pair of locking flaps held between each of said double-part fold-up sides and fold-up ends, the improvement comprising: each said shelf being a fold-around rectangular tube with ends abutting and proportional for stacked fitting in said box with a said drawer in said fold-around rectangular tube, each of said drawers being symmetrical side-to-side and



end-to-end, and each drawer being, when unfolded, generally in the shape of a broad cross.

4,437,714

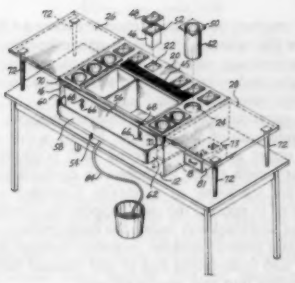
PORTABLE BAR-CABINET

Gordon K. Struck, 11848 26th Ave. South, Seattle, Wash. 98168

Filed Dec. 21, 1981, Ser. No. 332,921

Int. Cl.³ A47B *57/00, 81/00*

U.S. Cl. 312—281 **17 Claims**



1. A portable bar-cabinet comprising:

a top, bottom, two sidewalls and two endwalls, together defining a cabinet having an inner space;

said top including a major opening for receiving a removable ice tub having an upper boundary which is substantially flush with the upper surface of the top when the tub is in said major opening;

said top also including a plurality of minor openings offset outwardly from the tub opening for receiving removable holders;

said cabinets inner space including a tub receiving space below the major opening and a storage space outwardly adjacent the tub receiving space;

a pair of counter panels;

hinge means connecting the counter panels to the cabinet substantially where the endwalls intersect the top, for swinging movement between a folded position in which the counter panels extend over the cabinet top and a counter forming, in use position in which the counter panels project laterally outwardly like wings from opposite sides of the cabinet top;

support means for supporting said counter panels in their counter forming positions;

handle means carried by one of the sidwalls of the cabinet, enabling the cabinet to be picked up and carried like a suitcase when the counter panels are in their folded positions; and

means forming a pair of stiffener beams which extend later-

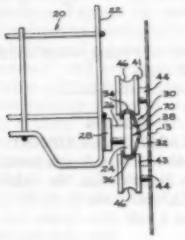
ally across the bar-cabinet where the endwalls of the cabinet intersect the bottom of the cabinet, said stiffener beams providing stiffness to both the endwalls and the sidewalls, and also presenting an upper support surface on which at least some of the removable containers rest, so that the weight of such containers and their contents are not carried by the top.

4,437,715

RACK SUPPORTING CHANNEL AND STOP

Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 10, 1981, Ser. No. 282,107
Int. Cl.³ A47B 88/00
U.S. Cl. 312—348 6 Claims



1. In a structure providing a chamber having a front opening and side walls, wherein there is an article-holding rack carried by rack-supporting members for inward and outward movement of the rack relative to the structure, a rack-supporting channel and stop arrangement comprising:

a rack-supporting elongated channel member mounted to the side wall of the chamber having a side wall portion and upper and lower curved wall portions converging toward each other to define an open-ended, elongated internal trackway of generally C-shaped cross section adapted to receive the rack-supporting members with one end of said trackway facing the front opening of the chamber; said channel member including retainer means formed near said front-facing end of said channel member rigidly extending into said trackway; and

a stop member extending into said front-facing end of said channel member to limit the outward travel of the rack-supporting members in said trackway, said stop member comprising:

a cap portion of enlarged cross section abuttingly engaging said front-facing end of said channel member;

a neck portion of reduced cross section extending from said cap portion into said trackway;

a rigid central body portion received in said trackway rigidly joined to said cap portion by said neck portion; said central body portion extending laterally toward said side wall portion of said channel member behind said retainer means, said retainer means extending between said central body portion and said cap portion thereby limiting outward movement of said stop member relative to said channel; and

a lateral positioning member extending from said central body portion and adapted to flex longitudinally relative to said central body portion and to rigidly oppose lateral motion relative to said central body portion; said positioning member being flexibly movable between a normal position and an assembly position and self-biased to its normal position, said positioning member when in its normal position being received in and substantially spanning said trackway between the uppermost and lowermost interior portions of said curved wall portions of said channel member thereby limiting lateral movement of said stop member relative to said channel member, and when in its assembly position being sufficiently remote from at least one of said curved portions of said channel member so as to permit lateral movement of said stop member relative to said channel member thereby facilitating the lateral insertion of said stop member in said trackway during assembly;

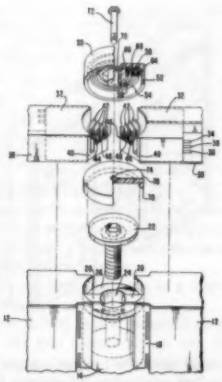
whereby longitudinal loads applied to said stop member by the rack-supporting members resulting from outward movement of the rack are opposed by the interaction of said rigid central body portion of said stop member and said retainer means of said channel member.

4,437,716

ELECTRIFIED WALL PANEL SYSTEM

Gordon J. Cooper, Alto, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1982, Ser. No. 350,525
Int. Cl.³ H01R 39/00
U.S. Cl. 339—4 7 Claims



1. A power distribution system for an electrified, open office, space dividing wall panel system, said power distribution system comprising:

at least two planar space dividing wall panels having substantially vertical side edges, each of said space dividing wall panels including a terminal block adjacent each upper corner thereof and a wireway adjacent the top edge of each of said panels interconnecting said terminal blocks;

an extension member extending outwardly of said panel from said terminal blocks having at least three arcuate electrical contacts thereon;

a support post mechanically interconnecting and supporting said at least two planar panels; and

a cylindrical conducting cap having at least three concentric ring contacts on the underside thereof constructed and arranged to coact with said at least three electrical contacts on adjacent extension members to transfer electrical power from one space dividing wall panel to an adjacent space dividing wall panel.

4,437,717

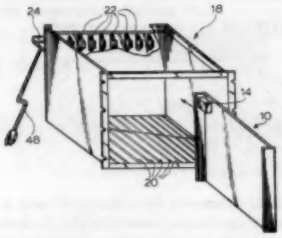
RACK MOUNTABLE PRIMARY POWER AC PLUG

James L. Korzik, Palm Harbor, and Thomas Wissman, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Sep. 28, 1981, Ser. No. 306,543
Int. Cl.³ H05K 1/18
U.S. Cl. 339—17 LC 8 Claims

1. A device for use in combination with a rack mounted card cage to supply power to a printed circuit card when disposed in the rack mounted card cage, which includes:

a plug means coupled to lead means connectable to a source of primary power;
a printed circuit card having receiving means to provide a mating relationship with said plug means and to provide power to said card;
a back plane supported by said card and functionally separate from said receiving means;



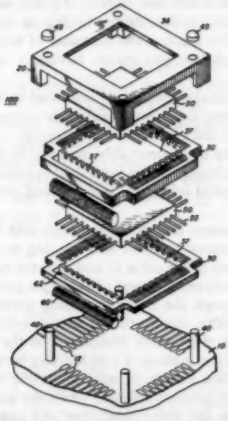
an M-board supported by the card cage for coupling with said back plane when said card is disposed in said cage; and
wherein said receiving means and said plug means function to provide primary power to said card separate from said M-board and back plane.

4,437,718

NON-HERMETICALLY SEALED STACKABLE CHIP CARRIER PACKAGE

George J. Selinko, Lighthouse Point, Fla., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 17, 1981, Ser. No. 331,498
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—61 M **5 Claims**



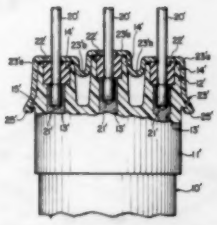
1. An improved stackable chip carrier assembly for use in electronic apparatus which will accommodate a plurality of vertically stacked integrated circuit devices on and provide solderless electrical connection to a printed circuit board, including in combination:
a stacked array of interfitting spacer members of substantially equal size and dimension, each spacer member having a central cavity for accommodating a respective associated integrated circuit device therein, and a plurality of elongated slots positioned around the periphery of said spacer member and extending therethrough;
a plurality of elastomer conductive interconnecting bars captivated within said elongated slots of said spacer members for effecting electrical connection in solderless fashion directly between adjacent devices or between the associated devices and the printed circuit board;
and a protective enclosure overfitting said spacer members for securing the same in said stacked array on the associated printed circuit board.

4,437,719

CONNECTOR FOR AUTOMOTIVE IGNITION DEVICES

Yoshimi Miyamoto, Toyota, Japan, assignor to Nippondenso Company Limited, Kariya, Japan

Continuation of Ser. No. 138,920, Apr. 10, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,399
Claims priority, application Japan, Jun. 13, 1979, 54-074354
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—91 R **10 Claims**



1. A connector for an ignition device, comprising a housing which includes a base portion formed with a notch and secured to said ignition device and a cylindrical upstanding portion having an open end at the upper end thereof, a first terminal of a female type embedded in said base portion of the housing below the other end of said upstanding portion and electrically connected to said ignition device, a second terminal of a male type attached to an end of a conductor which extends through the interior of said upstanding portion of said housing to make an electrical connection with said female terminal, the inner diameter of said upstanding housing portion being greater than the inner diameter of said female terminal and the diameter of said male terminal being greater than the diameter of said conductor, an insulative sealing body of an elastic material axially extending from said open end to the other end of said upstanding portion and radially extending from the circumference of said conductor to the inner walls of said upstanding portion to fluid-tightly seal said conductor, and a cup-shaped member of an insulative material having a pawl for engaging the notch of said base portion to hold the cup-shaped member in pressure contact with said sealing body so that the sealing body maintains an intimate, fluid-tight contact with the surface of the conductor and the inner walls of said upstanding housing portion.

4,437,720

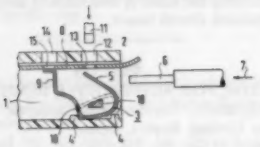
SCREWLESS TERMINAL

Werner Harbauer, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,615
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044133
Int. Cl.³ H01R *4/48*
U.S. Cl. 339—95 D **12 Claims**

1. A screwless wiring or connecting terminal comprising a housing, a leaf-type clamping spring configured and secured in the housing so that a first end of the spring can be tensioned from an uncocked position into a releasable cocked position in which the first end of the spring extends toward an adjacent portion of the spring, and a detent disposed in the adjacent portion of the spring configured to releasably retain the first end of the spring in the cocked position, there being a predeter-

mined clearance between the first end of the spring and the interior of the housing in the cocked position of the spring such that a conductor can be inserted therebetween without having



to overcome any spring tension, the first end and the housing being adapted when in the uncocked position of the spring to engage a conductor inserted therebetween.

4,437,721

CONNECTION TERMINAL FOR ELECTRICAL CONDUCTORS

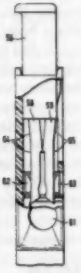
Hans-Josef Köllmann, Minden; Lothar Hennemann, Enger, and Wolfgang Hohorst, Minden, all of Fed. Rep. of Germany, assignors to Wago Verwaltungsgesellschaft mit beschrankter Haftung, Minden, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,447

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034570; Apr. 1, 1981, 3112969

Int. Cl.³ H01R *4/00*

U.S. Cl. 339—97 P **5 Claims**



1. A connection terminal for an electrical conductor comprising:

a. a body made of an electrical insulating material, said body having a seat formed therein for receiving said conductor;

b. a current strip in said body; and

c. a clamping spring movably mounted in said body, said clamping spring having a generally U-shaped portion which defines a pair of clamping arms, said clamping spring being movable in a plunger-like manner to an operative position wherein when said conductor is received in said seat the inner edges of said arms engage said conductor and the outer edges of said arms engage said strip to electrically connect said conductor to said strip through said arms.

4,437,722

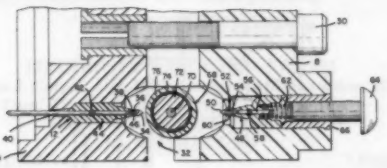
COAXIAL CABLE TAP

Edward A. Bianchi, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 139,035, Apr. 10, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,586

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—97 P **9 Claims**



1. A coaxial cable connector for connection with a coaxial cable having a center conductor, insulation sheath surrounding the center conductor, an outer conductor extending along the insulation sheath and an outer insulating jacket covering the outer conductor, said coaxial cable connector comprising:

first and second matable housing means having channel means along which a section of the coaxial cable is to be disposed;

first probe means mounted in said first housing means and second probe means mounted in said second housing means;

said first and second probe means having conductive means secured in dielectric means defining cable-penetrating means, said conductive means having conical portion means, axial segment means, and base means contiguously joining said axial segment means and said conical portion means, said axial segment means having a diameter therealong less than said base means, said dielectric means secured on said axial segment means extending rearwardly from said base means and having first and second section means, said first section means having an outer diameter substantially the same as the diameter of said base means and said second section means having a tapered outer surface;

said first probe means stationarily mounted in an opening in said first housing means with said cable-penetrating means extending into the channel means thereof;

said second probe means movably mounted in an opening in said second housing means with cable-penetrating means normally disposed within the opening and out of the channel means;

first operating means connected between said first and second housing means to move said housing means together with the section of the cable in said channel means causing said cable-penetrating means of said first probe means to penetrate through the outer insulating jacket, the outer conductor, within the insulation sheath with the conical portion means electrically connected to the center conductor during the mating of said housing means together, said first section means of said dielectric means being disposed in the insulation sheath while the second section means engages the outer conductor and outer insulating jacket thereby insulating the conductive means of said first probe means in connection with the center conductor from the outer conductor; and

second operating means connected to said second probe means for moving said second probe means along the opening in said second housing means after the housing means have been mated together causing the cable-penetrating means of said second probe means to penetrate through the outer insulating jacket, the outer conductor, within the insulation sheath with the conical portion means engaging the center conductor, said first section means of said dielectric means being disposed in the insulation sheath while the second section means engages the

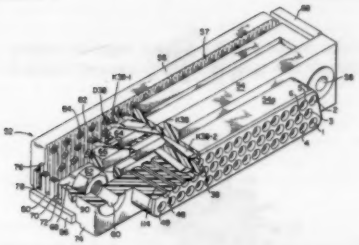
outer conductor and outer insulating jacket thereby insulating the conductive means of the second probe means in connection with the center conductor from the outer conductor.

4,437,723

THREE-ROW CONNECTOR FOR MASS TERMINATING FLAT CABLE

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 30, 1980, Ser. No. 221,396
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—99 R **24 Claims**



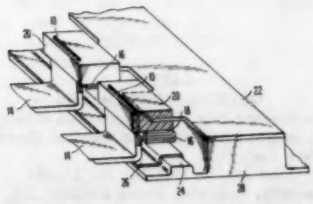
1. An electrical connector for insulation-piercing termination of flat multiconductor cable, said connector comprising an elongate housing supporting electrical contact elements in at least first, second and third laterally spaced parallel rows, each said contact element including a first end portion of insulation-piercing type and a second end portion, laterally opposite ones of said second end portions in said first and third rows being in corresponding first longitudinal positions, said second end portions in said second row being in second longitudinal positions different from said first positions, all of said first end portions being in non-corresponding longitudinal positions.

4,437,724

SYSTEM FOR SHIELDING MASS-TERMINATED FLAT RIBBON CABLE

Lubomir J. Volka, Holbrook, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 134,522, Mar. 27, 1980, Pat. No. 4,345,811. This application Feb. 1, 1982, Ser. No. 344,556
Int. Cl.³ H01R *4/66, 23/12, 23/38*
U.S. Cl. 339—143 R **14 Claims**



1. A shielding system for a flat ribbon cable, a shield layer of electrically conductive material being disposed in generally longitudinal relationship with one side of said flat ribbon cable, a readily severable jacket of flexible insulating material encompassing said flat ribbon cable and said shield layer, a section of said shield layer folded back, said shielding system comprising:

connector means for connecting said flat ribbon cable; and

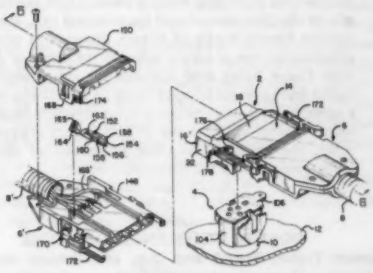
an electrically conductive clip crimped upon said folded back section of said shield layer, said clip comprising a U-shaped channel having parallel sides, one of the parallel sides attached to a side of said connector means by an attaching means, the outer surface of the leg connecting the two parallel sides of said U-shaped channel projecting below the surface of the bottom of said connector means.

4,437,725

JUNCTION CONNECTIONS FOR MODULAR WIRING SYSTEMS

Daniel G. Eaby, Mt. Joy; William B. Long, Camp Hill, and John R. Shuey, Carlisle, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1981, Ser. No. 249,518
Int. Cl.³ H01R *13/514*
U.S. Cl. 339—156 R **15 Claims**



1. An electrical junction connector which is intended for use in a power distribution system of the type comprising distribution cables having cable conductors therein, cable connectors on the ends of said cables, junction connectors at the electrical junctions in said system, and tap connectors, said cable connectors and said tap connectors being coupled to said junction connectors, said junction connector comprising a junction connector housing having oppositely directed cable connector receiving faces and having a tap connector receiving face, said housing having cable connector terminals therein proximate to said cable connector receiving faces and having tap connector terminals therein proximate to said tap connector receiving face, said cable terminals being mateable with complementary cable terminals in said cable connectors, said tap terminals being mateable with complementary tap terminals in said tap connector, said tap terminals being selectively connected to said cable terminals to provide tap connections to said cable conductors, said junction connector being characterized in that:

said junction connector housing has a plurality of side-by-side parallel feed-through conductors therein extending between said cable connector receiving faces, said cable terminals being on the ends of said feed-through conductors,

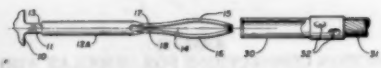
said housing has a plurality of rigid tap conductors therein, each of said tap conductors having a first end which is connected to one of said feed through conductors, said tap conductors extending from said feed-through conductors to said tap connector receiving face and having said tap terminals on their ends,

at least one of said tap conductors having an intermediate portion which extends laterally of said first and second ends whereby said second end is parallel to, and offset from, said first end, and said second ends are arranged in a cluster at said tap connector receiving face.

4,437,726
FLEXIBLE PIN

Roger T. Lambert, Fridley, Minn., assignor to Omnetics, Inc., Minneapolis, Minn.

Filed Jun. 14, 1982, Ser. No. 387,969
Int. Cl.³ H01R 11/22
U.S. Cl. 339—252 P 12 Claims



1. For use with a tubular receiving connector member, a flexible pin used in conjunction therewith, comprising:

(a) an elongated sheet metal member having first and second portions defining a longitudinal axis;

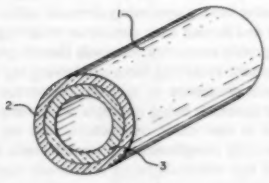
(b) said first portion having a barrel shape in which the lateral edges thereof are bent towards each other with a gap formed therebetween;

(c) said second portion cantilevered integrally from said first portion and extending away from said first portion generally in the direction of said longitudinal axis, said second portion having a pair of fingers disposed in confronting relationship, one of which is the mirror image of the other, each finger being bent towards the other about a first radius and upon each finger being formed to the tangent of a second and shorter radius, conforming said finger to said second radius until the tips of said fingers approach each other, the greatest transverse projection of said fingers being greater than the barrel diameter.

4,437,727
QUARTZ GLASS ENVELOPE TUBE

Norbert Treber, Kriftel, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Jun. 3, 1982, Ser. No. 384,467
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128698
Int. Cl.³ G02B 5/14; C03C 25/02; F16L 9/14
U.S. Cl. 350—96.3 13 Claims



1. Quartz glass envelope tube for the production of a light guide fiber blank, in the form of a laminate, the internal layer consisting essentially of fused rock crystal or quartz sand and the external layer of synthetic quartz glass, the total tube wall thickness of said tube being not greater than 10 mm, the external layer being at least 0.2 mm thick and amounting to approximately 2 to 50% of the total tube wall thickness.

5. A rod for the formation a light guide fiber consisting essentially of:

(a) an internal quartz glass rod itself consisting essentially of

(1) a core

(2) a sheath disposed about said core; and

(b) a quartz glass envelope tube disposed about said internal quartz glass rod itself consisting essentially of

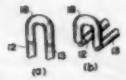
(1) an internal layer consisting essentially of fused rock crystal or quartz sand;

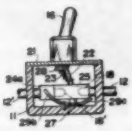
(2) an external layer consisting essentially of synthetic quartz glass, a total tube wall thickness of said tube being not greater than 10 mm, the external layer being at least 0.2 mm thick and amounting to approximately 2 to 50% of the total wall thickness of said envelope tube.

4,437,728
PHOTO-SWITCH

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,761
Claims priority, application Japan, Sep. 30, 1980, 55-140408[U]
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 9 Claims





1. A photo-switch comprising: a switch case; a first and a second photo-transmissive body introduced into said switch case and having ends arranged in parallel with each other; a third photo-transmissive body which is bent to have parallel ends opposing said ends of said first and second photo-transmissive bodies; a shielding member adapted to shield the ends of said first and second photo-transmissive bodies from each other; and a switching means operable in accordance with the operation of a handle rockably mounted on said switch case, in such a manner that, when said ends of said third photo-transmissive body are brought to oppose said ends of said first and second photo-transmissive bodies with a small gap therebetween or into contact with the same, said shielding member is moved away from said ends of said first and second photo-transmissive bodies whereas, when said ends of said third photo-transmissive body are moved away from said ends of said first and second photo-transmissive bodies, said shielding member is brought into the space between the ends of the first and second photo-transmissive bodies to optically insulate them from each other, thereby to selectively interrupt the transmission of light between said first and second-photo-transmissive bodies.

4,437,729
OPTICAL FIBRE CABLES

Colin S. Parfree, and Peter Worthington, both of Southampton, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,692
Claims priority, application United Kingdom, Jun. 26, 1980, 8021035
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.23 2 Claims

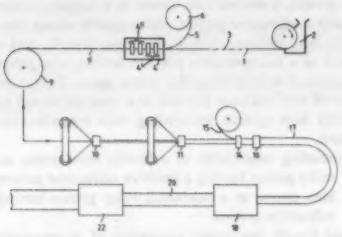
1. An optical fibre cable comprising in combination

an optical fibre,

a closed metallic tubular conductor surrounding said optical fibre, said closed tubular conductor being formed from a pre-sized C-section tube,

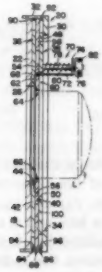
a tensile strength member surrounding said closed tubular conductor,

copper tape disposed on the outside of said tensile strength member,



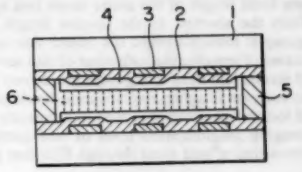
a dielectric layer surrounding said copper tape, and
a sheath disposed on the outside of said dielectric layer.

4,437,730
CAMERA ADAPTER
Trammell Pickett, 7053 Placida Rd., Englewood, Fla. 33533
Filed Oct. 15, 1981, Ser. No. 311,777
Int. Cl.³ G02B 7/02
U.S. Cl. 350—257 **6 Claims**



1. A lens mount configured to permit relative movement between the camera axis and lens axis while maintaining the image plane and focal plane in substantially parallel relation relative to each other: said lens mount comprising a housing to operatively retain an adjustment means in limited movable relation relative to a stop means, said adjustment means comprising an inner and outer movable disc held in a fixed spaced relation relative to each other by a movable disc spacer disposed therebetween, a movable lens mounting ring to operatively receive a lens thereon coupled to said outer movable disc, said inner and outer movable disc, said movable disc spacer and said movable lens mounting ring each including a centrally disposed aperture formed therein, each said central disposed aperture coaxially aligned relative to said other centrally disposed aperture, said stop means comprising an inner stop plate including a centrally disposed stop aperture formed therein affixed to said housing, said movable disc spacer being movably disposed within said stop aperture such that the outer periphery of said movable disc spacer is engagable with the periphery of said stop aperture as said adjustment means is moved relative to said housing and said inner stop plate to limit the lateral movement of said adjustment means relative to said housing.

4,437,731
LIQUID CRYSTAL DISPLAY DEVICE
Ryoichi Sudo, Yokosuka; Fusaji Shoji; Takeshi Watanabe, both of Yokohama; Kenkichi Suzuki, Mobara, and Michio Ooue, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 17, 1981, Ser. No. 274,680
Claims priority, application Japan, Jun. 18, 1980, 55-81452; Nov. 7, 1980, 55-155784
Int. Cl.³ G02F 1/13
U.S. Cl. 350—340 **11 Claims**



1. A liquid crystal display device having a liquid crystal layer interposed between a pair of substrates with electrodes formed thereon, which comprises an alignment film being provided on each of opposing surfaces of the pair of substrates by mixing at least one compound selected from the following group A of organosilicon compounds represented by the general formulae (1) to (4) with at least one compound selected from the following group B of organometallic compound represented by general formula (5) in an atomic ratio of metallic atoms in organo-metallic compound to silicon atoms in organosilicon compounds of 1/10–8/1, dissolving the mixture in an organic solvent, applying the resulting solution to the substrate, and curing the solution;

Group A:

$$C_nH_{2n+1}Si(OR)_3 \quad (1)$$

$$C_nH_{2n+1}Si(OR)_2 \quad (2)$$
$$\quad\quad\quad

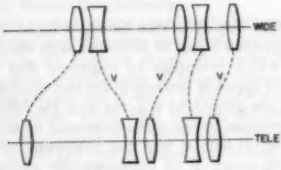
focal length, a third lens group having a positive focal length, a fourth lens group having a negative focal length and a fifth lens group having a positive focal length in the order from the object side, a wide magnification-variable range zoom lens system characterized in that over the entire range of focal length:

a partial lens system consisting of said first and second lens groups has a negative focal length and another partial lens system consisting of said third through fifth lens groups has a positive focal length;

when focal length of the entire zoom lens system is varied from the shortest to the longest length, said first lens group is moved toward the object side to accelerate increase of imaging magnification of said second lens group;

said second and third lens groups are moved in the direction to increase imaging magnification levels of their own;

said fourth lens group is moved to accelerate increase of the imaging magnification level of said partial lens system consisting of said third through fifth lens groups;



said fifth lens group is moved in the direction to increase the imaging magnification level of its own; and the airspaces reserved between the individual lens groups satisfy the following conditions:

$$dT_{1.2}(f)/df > 0$$

$$dT_{2.3}(f)/df < 0$$

$$dT_{3.4}(f)/df > 0$$

$$dT_{4.5}(f)/df < 0$$

wherein the reference symbols are defined as follows:

f: focal length of the entire zoom lens system

Tij(f): airspace reserved between the ith lens group and the jth lens group when the entire zoom lens system has a focal length f

dTij(f)/df: variation ratio of Tij(f) relative to f.

4,437,733

ZOOM LENS

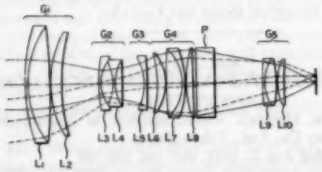
Tomowaki Takahashi, Kawasaki; Kunio Konno, Tokyo, and Toshihiro Sasaya, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 280,102

Claims priority, application Japan, Jul. 11, 1980, 55-93804

Int. Cl.³ G02B *15/16*

U.S. Cl. 350—427 **10 Claims**



1. A zoom lens which is compact and light in weight, which has a large aperture ratio of about 1:1.2 to 1:1.6, and which has a high zoom ratio of about 6 to 10, comprising, a magnification changing system including, in succession from the object side, a first lens means as a focusing portion having a positive refractive power, a second lens means as a variator portion having a negative refractive power and movable along the optical axis to thereby change chiefly the focal length, and a third lens means as a compensator portion having a negative refractive power and maintaining the image plane fluctuated by movement of said variator portion at a predetermined position, and a relay lens system succeeding said magnification changing system,

consisting essentially of a fourth lens means as a forward relay group having a positive refractive power and a fifth lens means as a rearward relay group having a positive refractive power,

said fourth lens means consisting of, in succession from the object side, a positive lens component having its surface of sharper curvature facing the image side, a biconvex cemented positive lens component having a cemented surface convex to the image side and a positive lens component having its surface of sharper curvature facing the object side, said fifth lens means consisting of a cemented positive lens component having a cemented surface convex to the object side and a positive lens component,

wherein said zoom lens satisfies the following conditions:

$$1.7 < \frac{|R_A|}{F_W} < 2.4 \quad (1)$$

$$0.5 < \frac{R_B}{F_W} < 2.0 \quad (2)$$

$$60 > \nu_{AP} - \nu_{AN} > 30 \quad (3)$$

$$60 > \nu_{BP} - \nu_{BN} > 20 \quad (4)$$

$$0.7 < \frac{D}{f_5} < 1.5 \quad (5)$$

$$1.0 < \frac{Rc}{Bf} < 5.0 \quad (6)$$

where R_A represents the radius of curvature of the cemented surface of the cemented lens component in said fourth lens means, ν_{AP} and ν_{AN} represent the Abbe numbers of a positive lens and a negative lens, respectively, forming said cemented lens component in said fourth lens means, R_B represents the radius of curvature of the cemented surface of the cemented lens component in said fifth lens means, ν_{BP} and ν_{BN} represent the Abbe numbers of a positive lens and a negative lens, respectively, forming said cemented lens component in said fifth lens means, F_W represents the focal length of the entire system at the wide angle end, f_5 represents the focal length of said fifth lens means, D represents the principal plane spacing between said fourth lens means and said fifth lens means, Rc represents the radius of curvature of the object side surface of the positive lens component in said fifth lens means, and Bf represents the back focal length.

4,437,734

LENSES CAPABLE OF CLOSE-UP PHOTOGRAPHY

Yutaka Iizuka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,524

Claims priority, application Japan, Aug. 27, 1980, 55-116923

Int. Cl.³ G02B *9/62, 13/02*

U.S. Cl. 350—454 **9 Claims**

1. A lens system capable of focusing continuously from infinite distance to close distance comprising, in the order from the object side,

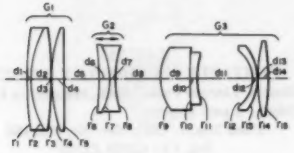
a converging first lens group disposed at a fixed distance from an image plane,

a diverging second lens group disposed movably along the optical axis thereof for focusing, and

a converging third lens group disposed at a fixed distance from the image plane,

said diverging second lens group maintaining paraxial rays exiting therefrom substantially parallel throughout all the range of focusing,

said first, second and third lens groups satisfying the following condition formulae:



$$1.0 < f_1/|f_2| < 1.4$$

$$1.6 \leq f_3/|f_2| \leq 2.2$$

wherein, f_1, f_2 and f_3 are focal lengths of said converging first lens group, diverging second lens group and converging third lens group, respectively.

4,437,735

INVERTED TELEPHOTO TYPE WIDE ANGLE OBJECTIVE OF LARGE RELATIVE APERTURE

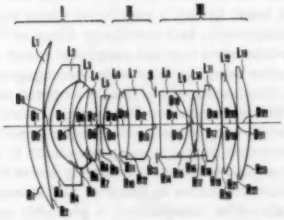
Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,709

Claims priority, application Japan, Jan. 22, 1981, 56-7134

Int. Cl.³ G02B *9/64, 13/04*

U.S. Cl. 350—458 **5 Claims**



1. An inverted telephoto type wide angle objective of large relative aperture comprising:

three lens groups, from front to rear, the first lens group having a negative refractive power and having, front front to rear, a positive meniscus lens of convex curvature toward the front, a negative meniscus lens of convex curvature toward the front, a negative meniscus lens of convex curvature toward the front, a positive lens and a negative meniscus lens of convex curvature toward the front, the second lens group having a positive refractive power and having a cemented bi-convex lens, and the third lens group having a positive refractive power and having, from front to rear, a cemented lens of a positive lens and a negative lens, a cemented lens of a negative lens and a positive lens, and two positive lenses.

4,437,736

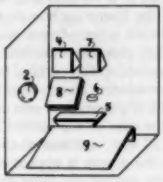
SUN VIEWING APPARATUS

Daniel R. Janosik, Sr., R.D. #1, Box 45-A, Hawley, Pa. 18428

Continuation-in-part of Ser. No. 107,336, Dec. 26, 1979, abandoned. This application Sep. 24, 1982, Ser. No. 423,164

Int. Cl.³ G02B *23/02, 23/16*

U.S. Cl. 350—538 **4 Claims**



1. A prefocused solar viewing apparatus self contained in a cubicle container comprising:

a. means for admitting solar rays comprising a first aperture in a first side of said cubicle

b. an objective lens

c. a first total reflecting prism in the plane of said first lens

d. a second reflecting prism

e. a magnifying field lens

f. a third reflecting prism in the plane of said field lens

g. means for reflecting light

h. a viewing surface

i. means to observe sun viewing surface which comprises a second aperture essentially larger than said first aperture in a second side of said cubical perpendicular to said first side,

j. a light shielding container wherein said elements are fixedly mounted whereby solar rays are admitted into said container through, a, by pointing said first aperture at the sun, said rays are admitted by, b, into a first plane and reflected by, c, into a second plane thereby striking said second prism, d, and reflected thereby into said magnifying field lens e causing said light rays to strike the third reflecting prism f and reflected thereby onto said reflecting means, g, and reflected thereby onto said viewing surface h visable from outside said container by means, i, without direct impingement of the solar rays upon the eye of the user.

4,437,737

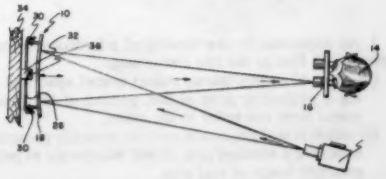
SCREEN AND METHOD OF EYE EXAMINATION USING SAME

Byron C. Rasmussen, 1035 N. Emporia, Wichita, Kans. 67214

Filed Mar. 11, 1981, Ser. No. 242,666

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—237 **6 Claims**



1. A screen apparatus for having light and more contrasting, brighter and clearer indicia reflected from the screen from a light and indicia source in the examination of the direct visual acuity of a patient having a refraction apparatus mounted over the eyes as in the nature of eyeglasses on the patient comprising a frame; a screen constructed and adapted to reflect light

mounted on said frame, said combined frame-screen having a structure generally defining a parabola with respect to a cross section and essentially including a radius approximately equal to the distance the eyes of the patient are from the combined screen-frame; and a mounting means attached to said frame and capable of permitting positioning of the combined frame-screen about both a vertical and a horizontal axis to direct light to the eyes of the patient through the refraction apparatus, said mounting means comprises a cross member having a horizontal arm connected to a vertical arm said horizontal arm pivotally attaching to the frame such as to enable horizontal pivotation of the combined screen-frame member about the horizontal axis; a bracket member mounted to a stationary object and pivotally attached to the vertical arm allowing vertical pivotation of the combined screen-frame about the pivotation connecting points of the vertical arm and the bracket member, said distance of the eyes of the patient and said radius are between about 5 and 25 feet, and said distance of said light and indicia source from the screen is approximately equal to the distance the eyes of the patient are from the screen.

4,437,738

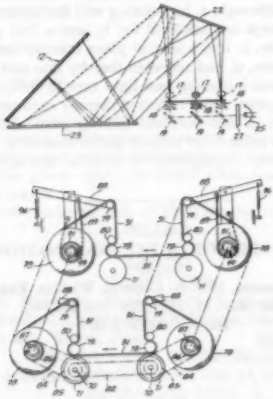
OPTICAL ROLLFICHE READER

James E. R. Headley, 2516 Canyon View La., Pasadena, Calif. 91107; William R. Limburg, Torrance, Calif.; Robert A. Nordmeyer, Woodland Hills, Calif., and Jay Smith, III, Santa Monica, Calif., assignors to Henry Frank Yoder, III; Donald Yoder, both of Tustin, Calif.; Arthur B. Willis, deceased, Los Angeles, Calif., Title Insurance and Trust Company, executor; Dean S. Butler; John A. Fusco, both of Whittier, Calif.; Peter K. Adler, Fairfax, Va. and James E. Headley, Monterey Park, Calif., a part interest

Continuation of Ser. No. 141,456, Apr. 18, 1980, abandoned. This application Apr. 16, 1981, Ser. No. 254,748

Int. Cl.³ G03B *23/12, 21/22*

U.S. Cl. 353—26 R **19 Claims**



1. An apparatus for the viewing of microcopy recorded on photograph film or the like comprising:

(a) a pair of supply/takeup rollers spaced apart and providing a projection zone in that portion of the film which passes from one roller to the other,

(b) means in said projection zone for optically projecting and enlarging a selected area of said microcopy to project an enlarged image of said area,

(bb) screen means for viewing the enlarged projected microcopy image,

(c) film driving means on opposite sides of said projection zone for driving said film therethrough in either direction,

(d) tensioning means responsive to slack in the film positioned between said driving means and said supply/takeup rollers for tensioning said film to eliminate slack in said film to allow instantaneous reversal of driving said film without backlash,

(e) brake means operatively connected to the tensioning means for engaging said supply/takeup rollers when excessive tension is present in the film, and

(f) clutch means mounted on said supply/takeup rollers such that said brake means engages a supply/takeup roller only when such roller is used as a supply roller and film is being withdrawn therefrom.

4,437,739

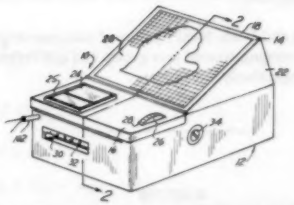
PORTABLE MAP DISPLAY DEVICE

John R. Haskin, Lincoln Park, Mich., assignor to Larry L. Ball, Utica, Mich., a part interest

Filed Sep. 7, 1982, Ser. No. 415,165

Int. Cl.³ G03B *23/08*

U.S. Cl. 353—27 R **3 Claims**



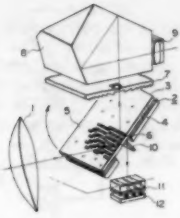
1. A portable display device comprising a rectangular box-like housing, a hinged lid on said housing in the form of a hinged frame supporting a rearview projection screen, a support rod member fixedly mounted in said housing, a hollow drum mounted rotatable around said support rod member and axially displaceable along said support rod member, said hollow drum having a peripheral cut-out portion with a microfilm fiche module insert removably and interchangeably disposed in said peripheral cut-out portion of the drum, said microfilm fiche module insert having a curvilinear frame supporting a microfilm transparency, said curvilinear frame of said microfilm fiche module insert and said peripheral cutout portion of said hollow drum being provided with interengageable attachment means, illuminating means fixedly mounted on said support rod within said drum for illuminating a portion of said microfilm transparency of said microfilm fiche module insert, lens means mounted in said housing proximate to said drum and optically aligned with said illuminating means for projecting on said rearview screen an image of said illuminated portion of said microfilm transparency, a pivotable sector knob edgewise projecting through a slot in said housing, a sleeve member rotatably disposed around said support rod member, said sleeve member having an end attached to said pivotable sector knob and another end attached to an end of said drum by sliding coupling means, a bifurcated member slidably engaging said drum at each end thereof, a manually actuated lever attached to said bifurcated member and having an end projecting through a second slot in said housing whereby said drum is longitudinally displaceable along its axis of rotation as a result of longitudinal displacement of said manually actuated lever, said drum is rotatable around said support rod member as a result of pivoting said second knob, and co-ordinate reference markings co-operate with said pivotable sector knob and said manually actuated lever for controllably indexing a predetermined portion of said microfilm transparency with said illuminating means and said lens means.

4,437,740

QUICK RETURN BEAM SPLITTER FOR A SINGLE LENS REFLEX CAMERA

Takashi Suzuki, Yokohama, and Susumu Ito, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,473
Claims priority, application Japan, Aug. 18, 1981, 56-29168
Int. Cl.³ G03B 7/099
U.S. Cl. 354—476 5 Claims



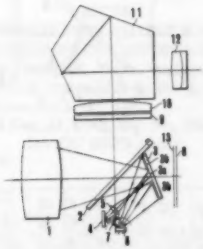
1. A quick return beam splitter for a single lens reflex camera comprising:
- a transparent substrate member;
- a metal reflecting film of relatively high reflection factor formed on a portion of the surface of said transparent substrate member; and
- a reflecting film of relatively low reflection factor formed on that portion of the surface of said transparent substrate member on which said metal reflecting film is not formed.

4,437,741

LIGHT MEASURING DEVICE FOR A SINGLE LENS REFLEX CAMERA

Yasuhisa Sato, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1982, Ser. No. 400,080
Claims priority, application Japan, Jul. 28, 1981, 56-118889
Int. Cl.³ G03B 7/08
U.S. Cl. 354—479 5 Claims



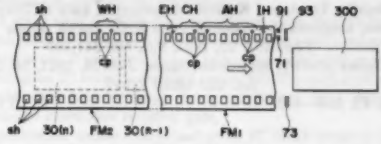
1. A light measuring device for a single lens reflex camera having a swinging mirror, comprising:
(a) light sensitive means;
(b) an auxiliary mirror positioned behind said swinging mirror to conduct a light beam passed through said swinging mirror to said light sensitive means, the reflection surface of said auxiliary mirror being divided into a plurality of regions and being shaped such that said light beam after reflection from the regions is divided into respective parts which go to different directions from each other; and
(c) light beam selecting means for conducting one of the light beams from said plurality of regions to said light sensitive means.

4,437,742

CAMERA CAPABLE OF AUTOMATICALLY RESPONDING TO DATA CODED ON FILM

Nobuyuki Taniguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1981, Ser. No. 304,957
Claims priority, application Japan, Oct. 9, 1980, 55-141302; Oct. 9, 1980, 55-141303; Oct. 29, 1980, 55-152579
Int. Cl.³ G03B 7/00
U.S. Cl. 354—21 3 Claims



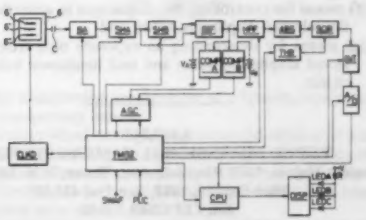
1. A camera capable of automatically responding to film speed data received from a film to be loaded in the camera comprising:
- means for receiving digital data representative of the film speed from the film;
- means for storing the digital film speed data received by said receiving means;
- a digital calculating means, responsive to the digital data stored in said storing means, for calculating digital exposure information;
- means for generating predetermined invariable digital data representative of a constant film speed capable of being substituted for the digital data to be stored in said storing means;
- means for automatically adopting said invariable digital data to substitute it for the digital data from the film when said storing means is incapable of storing the digital data from the film;
- means for digitally displaying the result of the calculation by said calculating means; and
- means for controlling the exposure of the camera in accordance with the result of the calculation by said calculating means.

4,437,743

SIGNAL PROCESSING SYSTEM

Shinji Sakai; Nobuhiko Shinoda; Takao Kinoshita, all of Tokyo, and Kazuya Hosoe, Kunitachi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,599
Claims priority, application Japan, Oct. 23, 1980, 55-149074
Int. Cl.³ G03B 3/10
U.S. Cl. 354—402 9 Claims



1. A signal processing system comprising:
(A) signal integrating-type radiation-sensitive means for generating a signal corresponding to an integrated value of radiation during an integrating time;
(B) means for controlling said integrating time;

(C) processing means for processing an output signal from said sensitive means; and

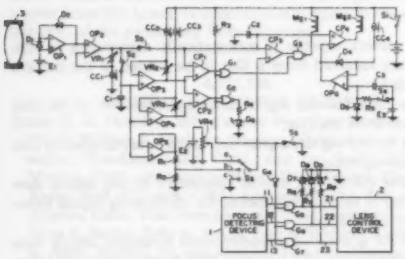
(D) threshold level controlling means connected to said integrating time controlling means for controlling a threshold level of signal processing at least at a part of said processing means on the basis of said integrating time.

4,437,744

AUTOMATIC EXPOSURE CONTROL APPARATUS FOR CAMERA

Nobuhiko Terui, and Kenichi Magariyama, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 22, 1982, Ser. No. 341,809
Claims priority, application Japan, Jan. 30, 1981, 56-12306
Int. Cl.³ G03B *7/097*
U.S. Cl. 354—442 **7 Claims**



7. An automatic exposure control apparatus for a camera provided with an automatic focusing apparatus with which the object distance is detected and the photographic lens is moved to a position in focus to the object by a driving system, said exposure control apparatus comprising:

(a) means for measuring the luminance value of the object;

(b) first setting means for setting the diaphragm value of the lens to a value in the range of the minimum diaphragm value to the maximum diaphragm value in response to said measuring means;

(c) second setting means for setting the diaphragm value of the lens to a value in the range of from a certain determined diaphragm value at which a determined depth of focus can be given to the lens to the maximum diaphragm value in response to said measuring means;

(d) operating means for enabling said automatic focusing apparatus to operate;

(e) means for selecting any one of the diaphragm value set by said first setting means and the diaphragm value set by said second setting means, said selecting means being disposed to select the diaphragm value set by said second setting means in response to the operation of said operating means;

(f) means for controlling the diaphragm in accordance with the selected diaphragm value; and

(g) means for determining an exposure time from said selected diaphragm value and said luminance value of the object.

4,437,745

THREE DIMENSIONAL CAMERA SYSTEM

Stephen Hajnal, 5600 Riverdale Ave., Bronx, N.Y. 10471

Filed Sep. 30, 1982, Ser. No. 432,029
Int. Cl.³ G03B *35/10*
U.S. Cl. 354—117 **8 Claims**

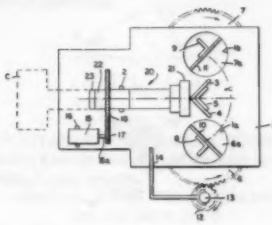
1. A stereo optics apparatus, comprising

(a) a zoom lens attachable to a camera body and having an operating element operable when moved in first and second directions to increase or decrease the focal length of said zoom lens;

(b) first and second spaced apart movable reflectors facing said zoom lens on either side of and transverse to the optical axis of said zoom lens, said first and second reflectors being movable to change the acute angle included therebetween;

(c) third and fourth reflectors facing said first and second reflectors, respectively, and said zoom lens;

(d) said reflectors being operable to divide the light entering said zoom lens into two separate beams;



(e) first electrical motor means for operating said operating element of said zoom lens;

(f) second electrical motor means for moving said first and second reflectors;

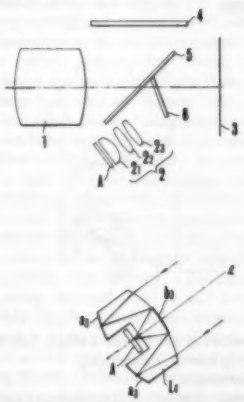
(g) said motors being operated in synchronism such that said included angle is increased or decreased by said second motor means as said focal length is decreased or increased, respectively, by said first motor means.

4,437,746

PHOTO METERING DEVICE FOR SINGLE LENS REFLEX CAMERA

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,838
Claims priority, application Japan, Apr. 9, 1981, 56-53592
Int. Cl.³ G03B *7/00*
U.S. Cl. 354—479 **5 Claims**



1. A photo metering device for a single lens reflex camera comprising:

(a) a photographic optical system for forming an object image on an image receiving means;

(b) a photo sensor for receiving light from the object;

(c) a biconvex condenser lens system arranged between said

image receiving means and said photo sensor, and having a first spherical surface and a second spherical surface;

(d) first reflective means formed on the center zone of said first spherical surface; and

(e) second reflective means formed on the center zone of said second surface arranged so that light from the object image is reflected by said first reflective means and said second reflective means and directed to the photo sensor.

4,437,747
DEVICE FOR MOUNTING AN ELECTRONIC FLASH UNIT

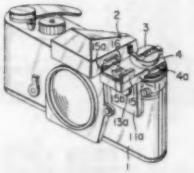
Masato Ohno, Chiba, and Keiji Ohsawa, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,005

Claims priority, application Japan, Apr. 21, 1981, 56-57655[U]

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—126 **8 Claims**



1. A device for mounting an electronic flash unit on a camera of the type having film-rewind operating means, accessory supporting means adjacent to said operating means, and a terminal for transmitting a signal to the flash unit, said device comprising a body having first means disposed to engage said accessory supporting means so as to support the body thereon and having second means for fixing the body to said camera, said body also having means for supporting said flash unit thereon at a position away from said film-rewind operating means and having means for electrically connecting said flash unit to said terminal when the flash unit is supported on said body.

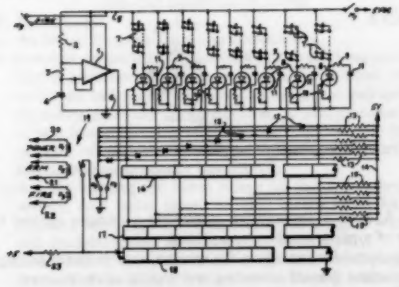
4,437,748
HIGH ILLUMINATION FLASHBULB ARRAY WITH FIRING SEQUENCE CONTROL MEANS

Richard H. Kelly, Issaquah, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 21, 1981, Ser. No. 333,217

Int. Cl.³ G03B *15/03*

U.S. Cl. 354—132 **1 Claim**



1. A high illumination flashbulb array with firing sequence control means comprising

a power bus,

a ground bus

an array of m strings of flashbulbs connected in parallel between said power bus and said ground bus, each string of flashbulbs comprising n flashbulbs connected in series, m and n being integers,

a switch means in series with each said string of flashbulbs, said switch means being comprised of silicon controlled rectifiers,

a pulse generator for generating a pulse train having a given PRF, said pulse generator comprising an IC timer having means for varying the PRF thereof,

an n stage shift register each successive stage thereof being outputted to control a discrete successive switch means in said array in response to said pulse train, said shift register being an IC serial to parallel converter, the output of each said shift register stage being connected to a discrete silicon controller rectifier gate,

amplification means comprised of an IC HEX inverter buffer/divider for amplifying the outputs of said shift register,

a control circuit controlling said pulse generator and said shift register to effect sequential firing of said strings of flashbulbs in response to off, power, arm and fire signals, and

an arm circuit, said arm circuit comprising a diode connected between each said silicon controlled rectifier gate and a grounded normally closed relay contact, said relay contact being opened in response to control circuit arm and fire operational sequences, said arm circuits applying a ground to the gate of said silicon controlled rectifier during off and power control circuit operative sequences and removing said ground during arm and fire operational sequences thereby preventing firing from spurious signals.

4,437,749
FILM TRANSPORTING ARRANGEMENT FOR CAMERAS

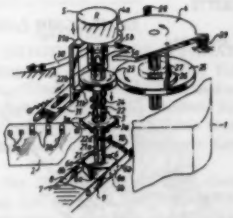
Gabriele Ehgartner, Pullach, and Gabriel Vondrovsky, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,338

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133774

Int. Cl.³ G03B *1/24*

U.S. Cl. 354—214 **16 Claims**



1. A film transporting arrangement of a camera, comprising

a film transporting handle;

a perforation wheel having a predetermined number of teeth and arranged to engage a perforated film in a film mouth of a cassette inserted or insertable in a camera and to move the film out of the cassette, said perforation wheel being rotatable in an open camera by hand;

a polygonal disk connected with said perforation wheel and having a plurality of surfaces and a number of corners corresponding to the number of teeth of said perforation wheel; and

two arresting arms pretensioned relative to one another, said arresting arms engaging the surfaces formed between two neighboring corners of said polygonal disk and corre-

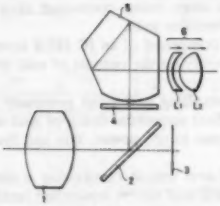
sponding to said surfaces between two neighboring corners so as to press said polygonal disk and thereby said perforation wheel to a respective angular position.

4,437,750

ADJUSTABLE DIOPTER TYPE FINDER OPTICAL SYSTEM

Kazuo Ikari, Hachiooji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,840
Claims priority, application Japan, Jun. 8, 1981, 56-87736
Int. Cl.³ G03B *19/12*
U.S. Cl. 354—155 **4 Claims**



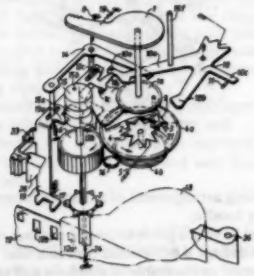
1. An adjustable diopter type finder optical system comprising an eyepiece comprising a first lens component having negative refractive power and a second lens component having positive refractive power, said finder optical system being arranged to make diopter adjustment by moving both of said first lens component and said second lens component in the same direction along the optical axis both with different amounts of movements.

4,437,751

FILM TRANSPORT ARRANGEMENT WITH PERFORATION WHEEL FOR CAMERA

Dieter Engelsmann, Unterhaching; Hubert Hackenberg, Holzkirchen; Peter Lermann, Naring; Karl Wagner, and Siegfried Zobel, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,100
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133775
Int. Cl.³ G03B *1/24*
U.S. Cl. 354—214 **12 Claims**



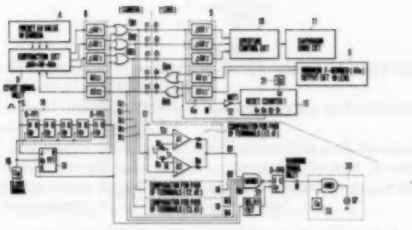
1. A film transport arrangement for a camera, comprising
a film transport handle;
a perforation wheel having a plurality of teeth and arranged to engage a perforated film accommodated in a cassette having a film mouth and inserted or insertable in the camera, and to move the film from the cassette; and
means for adjusting said perforation wheel and arranged between said film transport handle and said perforation wheel so that said perforation wheel is always held or brought into such and angular position in which one of its teeth engages in a perforation hole of a film initial portion lying in the film mouth of a cassette insertable or inserted in the camera.

4,437,752

SAFETY DEVICE FOR CAMERA AND ACCESSORY

Akira Akashi; Makoto Katsuma; Masaharu Kawamura, all of Kanagawa; Shigeru Kamata, Tokyo, and Syuichiro Saito, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 445,158
Claims priority, application Japan, Nov. 28, 1981, 56-191505; Dec. 2, 1981, 56-194183
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—289.12 **7 Claims**



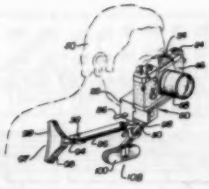
1. A device for detecting the conductivity of camera and accessory signal terminals through which an electrical signal is given or received between electrical circuits in a camera and in an accessory attached thereto, comprising:
means for detecting the failure to establish adequate conductivity across said signal terminals and for producing a discrimination signal representing whether or not the conductivity is adequate when said camera and said accessory signal terminals are in contact with each other; and
annunciating means responsive to said discrimination signal for producing an annunciation signal.

4,437,753

APPARATUS FOR SUPPORTING A CAMERA AGAINST THE STERNUM OF THE PHOTOGRAPHER

Robert E. Dunn, P.O. Box 1579, Cupertino, Calif. 95015

Filed Oct. 9, 1981, Ser. No. 310,214
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—293 **13 Claims**



1. A camera support for stabilizing a camera against the body of a photographer, comprising:
a pedestal for mounting the camera, said pedestal having a portion thereof extending rearwardly of the camera;
a first arm adjustably joined to said pedestal;
shoulder support means for engaging the shoulder of the photographer, said shoulder support means being attached to the end of said first arm remote from said pedestal;

a second arm adjustably joined to said portion of said pedestal extending rearwardly of the camera; and

sternal support means for engaging the sternum of the photographer, said sternal support means being attached to the end of said second arm remote from said pedestal.

4,437,754

APPARATUS FOR TRANSFERRING TONER IMAGES

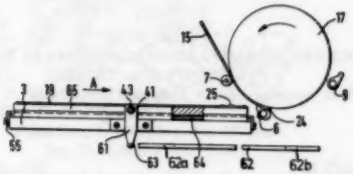
Hermann Idstein, Oestrich-Winkel, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,544

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136659

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **17 Claims**



1. Apparatus for transferring toner images from a moving photoconductor to an image carrier comprising:

(a) a cylinder mounted for rotation,

(b) means for securing at least a portion of said image carrier about the circumferential surface of said cylinder,

(c) a support table having an upper portion thereof supporting said photoconductor, said upper portion movable in a linear fashion adjacent said cylinder,

(d) means for mounting said cylinder and table for pressure contacting said image carrier and said photoconductor upon movement of said upper portion of said table, and

(e) means for synchronizing the linear speed of said upper portion of said table with the tangential speed of said image carrier secured to said cylinder.

4,437,755

LIQUID HANDLING APPARATUS FOR AN ELECTROSTATIC COPIER

Junichi Sakurayama, and Tamotsu Magome, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 31,945, Apr. 20, 1979, abandoned. This application Jul. 21, 1981, Ser. No. 285,670

Claims priority, application Japan, Apr. 28, 1978, 53-51834; Aug. 31, 1978, 53-106716

Int. Cl.³ G03G *15/10, 21/00*

U.S. Cl. 355—10 **5 Claims**

1. An image forming apparatus comprising:

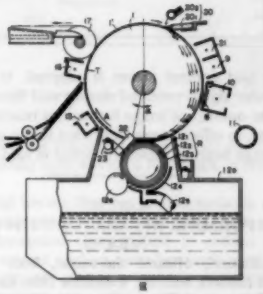
a rotatably supported drum-shaped image-carrying member having a circumferential surface on which a latent image is formed and a generally continuous lateral end surface extending generally perpendicularly to the rotational axis of said image-carrying member and bounded only by an extreme of said circumferential surface, said rotational axis extending generally horizontally,

means for forming the latent image on the circumferential surface, said latent image forming means being located adjacent said image-carrying member in a region wherein said circumferential surface moves downwardly,

means for developing the latent image at a developing station with a developing liquid, said developing means being located below said rotation axis of said image-carrying member,

means for transferring the developed image onto a transfer material, said transferring means being located adjacent said image-carrying member in a region wherein said circumferential surface moves upwardly,

means, located above said rotational axis in the region of the uppermost portion of said circumferential surface of said image-carrying member, for cleaning the circumferential surface to remove excess developing liquid, for directing the excess developing liquid toward said extreme of said circumferential surface, and for discharging the excess developing liquid removed from said member onto said lateral end surface to cause the excess developing liquid to travel downwardly on said lateral end surface during rotation of said image-carrying member under the influence of gravity, and



liquid guide means including a rod-like member disposed in contact with or in close proximity to said image-carrying member in the region of a portion of said circumferential surface at said extreme thereof and of said lateral end surface bounded by said extreme, said rod-like member extending in the direction of movement of said image-carrying member in the region of said developing means and guiding the excess liquid away from said lateral end surface of said image-carrying member at a position adjacent said developing means, thereby preventing the excess liquid from contacting the circumferential surface of said image-carrying member downstream of the developing station with respect to the movement direction of said image-carrying member.

4,437,756

DOUBLE-SIDE IMAGE FORMING APPARATUS

Kazuo Kawakubo, Chigasaki; Katsushi Furuichi, Yokohama; Kiyokazu Namekata, Machida; Hidetoshi Tanaka, Musashino; Yashikuni Tohyama, Yokohama; Toshirou Kasamura; Tomohiro Aoki, both of Yokohama, and Toshio Hosma, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 219,510, Dec. 23, 1980, abandoned. This application Jul. 28, 1982, Ser. No. 402,579

Claims priority, application Japan, Dec. 28, 1979, 54-171343; Dec. 28, 1979, 54-171344; Dec. 28, 1979, 54-171345; Dec. 28, 1979, 54-171346

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **17 Claims**

1. A double-side image forming apparatus, comprising:

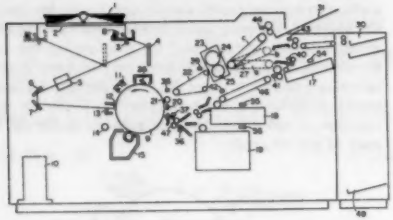
image forming means for effecting image formation on both faces of sheet-shaped image bearing members;

means for storing said image bearing members having an image on a first face thereof;

means for selecting the number of image bearing members to be subjected to said image formation; and

control means for effecting image formation by said image forming means in a first mode on the first face of each of said selected image bearing members, then temporarily storing said selected image bearing members in said stor-

age means, and for effecting image formation by said image forming means in a second mode on the second face of each of said selected image bearing members;



wherein said control means is adapted, in response to a particular signal received during said first mode and before the number of image formations reaches said selected number, to effect image formation in the second mode on the image bearing members stored in said storage means.

4,437,757

IMAGE FORMING APPARATUS WITH CLEANING MEANS

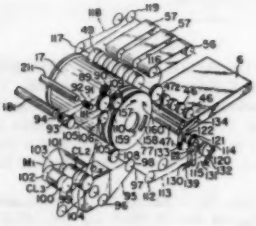
Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 893,825, Apr. 5, 1978, Pat. No. 4,270,857, which is a division of Ser. No. 860,457, Dec. 14, 1977, which is a continuation of Ser. No. 588,228, Jun. 19, 1975, which is a division of Ser. No. 583,247, Jun. 3, 1975, Pat. No. 4,009,955, which is a continuation of Ser. No. 461,104, Apr. 15, 1974, which is a continuation of Ser. No. 258,820, Jun., 1972, Pat. No. 3,804,512. This application Jan. 22, 1981, Ser. No. 227,209

Claims priority, application Japan, Jun. 3, 1971, 46-38917[U]; Jun. 3, 1971, 46-38918[U]; Jun. 9, 1971, 46-48632[U]; Jun. 10, 1971, 46-41195; Jun. 10, 1971, 46-41196; Jun. 10, 1971, 46-41197; Jun. 21, 1971, 46-44611; Aug. 30, 1971, 46-66740

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **3 Claims**



1. An image forming apparatus comprising:

a rotatable member;

means for forming a latent image on said rotatable member, said rotatable member having a portion which is not used for latent image formation;

developing means for applying a developer to the latent image on said rotatable member to form a toner image;

means for transferring the toner image onto a transfer material;

means for cleaning said rotatable member to permit reuse of said member for image formation; and

means for detecting a predetermined rotational position of said rotatable member and for stopping said rotatable member at the detected predetermined position where said non-image-forming portion of said rotatable member faces said cleaning means.

4,437,758

ALIGNMENT APPARATUS

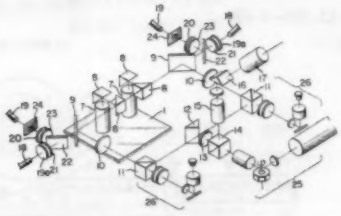
Akiyoshi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 195,490, Oct. 9, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,456

Claims priority, application Japan, Oct. 17, 1979, 54-134458

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—41 **4 Claims**



1. An apparatus for aligning a mask having a circuitpattern and an alignment mark thereon, and a sensitive member having an alignment mark thereon into a predetermined positional relation by using the two alignment marks, comprising:

a mask holder for supporting said mask;

a support member for supporting said sensitive member;

means for moving at least one of said mask holder and said support member relative to the other during an alignment operation to align a mask supported on said mask holder and a sensitive member supported on said support member;

an optical system in which during alignment operation said mask and said sensitive member are in a conjugate relation with each other with respect to non-sensitizing light and said mask and said sensitive member are in a defocused relation with each other with respect to sensitizing light;

means for detecting the relative positional relation between the alignment marks on said mask and said sensitive member using non-sensitizing light; and

means for selectively exposing the alignment mark on said sensitive member to sensitizing light during the alignment operation.

4,437,759

CONTACT PRINTER

Hidekatu Mizukami, Kyoto, and Yoshihiro Machida, Joyo, both of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 15, 1982, Ser. No. 418,379

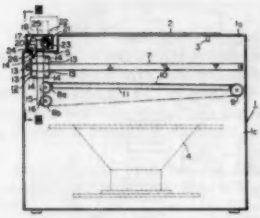
Claims priority, application Japan, Sep. 17, 1981, 56-145625; Sep. 17, 1981, 56-145626

Int. Cl.³ G03B *27/20*

U.S. Cl. 355—91 **11 Claims**

1. A contact printer wherein a spring roller is adapted to rotate on its own axis and to roll over a transparent plate, and wherein a flexible airtight sheet is wound round the spring roller and the free end of the flexible airtight sheet is fixed to the front end of the transparent plate so that the flexible airtight sheet may be extended to cover the transparent plate by rolling the spring roller rearwards, the improvement in that the distance between the transparent plate and the spring roller is gradually reduced by guide means, as the flexible airtight sheet is extended or the spring roller rolls rearwards over the trans-

parent plate, so that the distance between the transparent plate and the point of contact of the flexible airtight sheet to its own



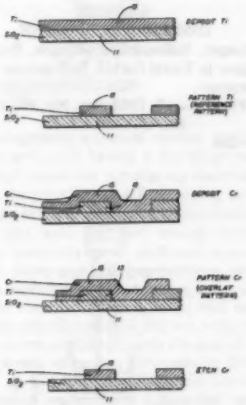
rolled part wound round the spring roller is maintained substantially to a fixed value.

4,437,760

REUSABLE ELECTRICAL OVERLAY MEASUREMENT CIRCUIT AND PROCESS

Christoper P. Ausschnitt, Southport, Conn., assignor to The Perkin-Elmer Corp., Norwalk, Conn.

Filed Dec. 7, 1981, Ser. No. 327,862
Int. Cl.³ G03B *27/32, 27/42*
U.S. Cl. 355—133 **15 Claims**



1. A reusable electric overlay measurement base pattern comprising:

(a) a pair of current pads forming first and second pads adapted to be contacted by point contacts;

(b) a first conductor of controlled width extending between said first and second pads;

(c) a pair of voltage pads forming third and fourth pads suitable for contacting by point contacts;

(d) two second conductors extending from said third and fourth pads to said first conductor, said second conductors contacting said first conductor at a predetermined spacing;

(e) a fifth pad disposed adjacent and spaced from said first conductor approximately at the midpoint between said two second conductors;

(f) a second level conductor extending between said fifth pad and said first conductor; the misalignment of said second level conductor being detected by measurements using said five pads;

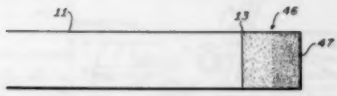
(g) all of said four pads which are interconnected, along with said fifth pad, being made of a metal which is resistant to an etchant which can be used in conjunction with a second level conductive layer to remove the second conductive layer after use.

4,437,761

REFRACTIVE INDEX TEMPERATURE SENSOR

Harry Kroger, Sudbury, and Richard A. Soref, Newton Centre, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,614
Int. Cl.³ G01J *5/08, 5/58*
U.S. Cl. 356—44 **20 Claims**



1. An apparatus for measuring temperature comprising:

means for guiding light having a first index of refraction n_1; and

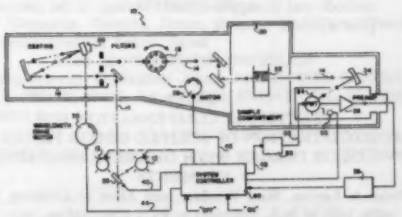
sensor material having first and second surfaces, a temperature dependent index of refraction n_2, and a smoothly varying absorption characteristic to reduce reflections from said second surface, said first surface aligned with said light guiding means to form a dielectric interface therebetween whereby light incident to said interface is reflected therefrom with an intensity that varies with temperature.

4,437,762

CONTROL OF DETECTOR GAIN HYSTERESIS IN A SINGLE BEAM SPECTROPHOTOMETER

Thomas J. Glenn, Irvine, and Wilbur I. Kaye, Corona del Mar, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 28, 1981, Ser. No. 334,806
Int. Cl.³ G01J *3/00*; H01J *40/00*
U.S. Cl. 356—326 **2 Claims**



1. A single beam spectrophotometer comprising:

a light source for illuminating a sample with light energy;

a photomultiplier detector for receiving light energy from the sample and generating an output signal proportional thereto, the photomultiplier including a photo-emissive cathode receiving incident light, a plurality of dynodes for multiplying electrons emitted by a cathode, and an anode at which the output current signal is derived;

means conditioning the single beam spectrophotometer during instrument "on" or "operating" intervals for measuring the sample, said conditioning means including means for energizing the light source and for supplying dynode voltage to the photomultiplier dynode;

a separate light source proximate the detector; and

means operative during normal instrument "off" or "idle" intervals, when the instrument is not conditioned for measuring a sample, (1) to energize the separate source

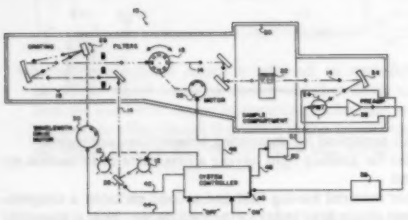
and hence illuminate the photomultiplier cathode and (2) to supply dynode voltage to the photomultiplier dynode.

4,437,763

CONTROL OF DETECTOR GAIN HYSTERESIS IN A SINGLE BEAM SPECTROPHOTOMETER

Wilbur I. Kaye, Corona del Mar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 28, 1981, Ser. No. 335,021
Int. Cl.³ G01J *3/00*; H01J *40/00*
U.S. Cl. 356—326 **3 Claims**



1. A single beam spectrophotometer comprising:

a light source for illuminating a sample with light energy;

a photomultiplier detector for receiving light energy from the sample and generating an output signal proportional thereto, the photomultiplier including a photo-emissive cathode receiving incident light, a plurality of dynodes for multiplying electrons emitted by a cathode, and an anode at which the output current signal is derived;

means conditioning the single beam spectrophotometer during instrument "on" or "operating" intervals for measuring the sample, said conditioning means including means for energizing the light source and for supplying dynode voltage to the photomultiplier dynode; and

means operative during normal instrument "off" or "idle" intervals, when the instrument is not conditioned for measuring a sample, to illuminate the photomultiplier cathode and to supply dynode voltage to the photomultiplier dynode.

4,437,764

ELECTRICAL COMPENSATION FOR MISREGISTRATION OF STRIPED COLOR FILTER IN A COLOR IMAGER WITH DISCRETE SAMPLING ELEMENTS

Peter A. Levine, West Windsor, and Allen L. Limberg, Titusville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,582
Int. Cl.³ H04N *9/07*
U.S. Cl. 358—44 **7 Claims**

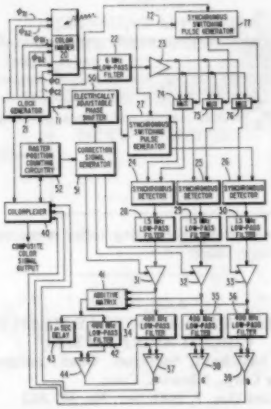
1. A color television camera comprising:

an imager having discrete sensing elements arrayed in columns and rows;

a color stripe filter interposed in the optical path to said imager, so its stripes project to respective columns of sensing elements;

means for deriving from said imager discrete derived samples of the respective colors of the information imaged on the imager, which samples are subject to cross-color errors owing to misregistration of the projected stripes and the columns of sensing elements; and

means for generating further color samples with reduced cross-color errors, including means for re-sampling said discrete samples to obtain said further color samples, each said further color sample comprising a portion of a derived sample differentially combined with a portion of an adjacent derived sample.

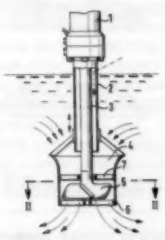


4,437,765

DISPERSION TURBINE

Hans-Peter Seeger, Ballrechten-Dottingen, Fed. Rep. of Germany, assignor to Ystral GmbH, Ballrechten-Dottingen, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 354,133
Int. Cl.³ B01F *5/12*
U.S. Cl. 366—264 **16 Claims**



1. In a vertical axis dispersion turbine which has a stator consisting of a stator tube with a lower end, an essentially cylindrical guide ring of larger diameter than said tube mounted thereon generally concentric with the lower end portion of the stator tube and extending below said lower end to define an annular chamber through which a medium to be mixed and dispersed may flow, an axial rotor shaft which is freely rotatable in the stator tube and has a rotor at its lower end with several blades inside the guide ring to draw the medium from above into and downwardly through the guide ring and dispersion means through which the medium flows, the improvement comprising:

the stator tube and the rotor shaft cooperate to define a substantially annular passage which is unobstructed throughout its length and at its lower end;

the relationship of the rotor blades to the lower end of the stator tube causes the downward flow of the medium through the guide ring to provide a venturi effect that produces a negative pressure in said annular passage;

and the dispersion means consists of a dispersion element

which is mounted on the guide ring in a plane transverse to the rotor shaft near the blades of the rotor and which is constructed and arranged for axial flow of the medium therethrough so as to reduce rotational flow of the medium and enhance the venturi effect.

4,437,766
MIXER HAVING TWO FEED WORMS DEFINING UPPER AND LOWER MIXING REGIONS WITH AN INTERMEDIATE EQUILIBRIUM ZONE

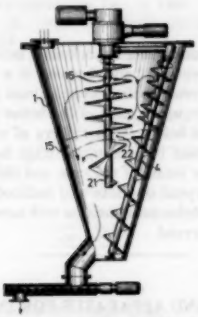
Rudolph Joachim, Weil der Stadt, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,216

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110437

Int. Cl.³ B01F 7/30

U.S. Cl. 366—287 **7 Claims**



1. A mixer comprising a conical mixing vat having a wall tapering downwardly and having a discharge outlet near the lower end thereof, means for introducing material to be mixed into said vat at the top thereof, a first mixing worm driven in rotation about its axis and in revolving movement within said vat proximate said wall, said first mixing worm having an upper region of relatively small pitch and a lower region of relatively large pitch and defining between said upper and lower regions a neutral conveyance zone, and a second mixing worm driven in rotation about its axis, said second mixing worm being centrally disposed in said vat with the axis of the second mixing worm concentric with the axis of said vat, said second mixing worm extending downwardly from the top of the mixing vat up to and into said neutral conveyance zone, said second mixing worm being cylindrical and having an outer diameter in close proximity with the outer diameter of said first worm, said first and second mixing worms being driven in respective directions of rotation to each convey the material in the vat.

4,437,767
LOWER SUPPORT FOR SINGLE SCREW MIXER

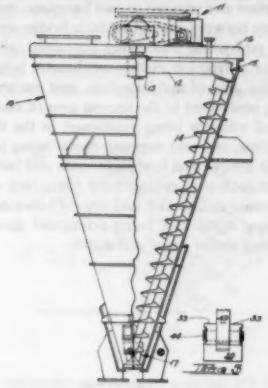
Richard A. Hargis, Cincinnati, Ohio, assignor to Day Mixing Company, Cincinnati, Ohio

Filed Mar. 4, 1983, Ser. No. 472,073

Int. Cl.³ B01F 7/30

U.S. Cl. 366—287 **7 Claims**

1. In a mixer having an inverted, truncated cone for a mixing chamber having also a top and a bottom, a horizontal orbit arm rotatable at a relatively slow speed about the axis of the mixer within the upper region thereof and with the outer end of said arm moving adjacent the inner periphery of said chamber, a mixing screw disposed parallel to the inner periphery of said chamber and rotatable on its own axis at a relatively high speed, coupling means attaching the upper end of said screw to the outer end of said orbit arm so as to permit linear movement between said screw and said arm, motor drive and gear means to rotate said orbit arm at its said slow speed and said screw at its said high speed, and a lower support for said screw, the improvement which is characterized by: said lower support comprising a rotatable vertical support shaft attached to the bottom of said chamber, an extension fixed on the lower end of said screw, a connecting shaft having one end freely received within said extension and the other end adjacent the upper end of said support shaft, and connecting means connecting said



support shaft to said connecting shaft so as to permit a rocking movement therebetween while ensuring that said support shaft and said connecting shaft will rotate together at said slow speed only, said extension on said screw rotating about said connecting shaft at said high speed, whereby deflections imparted to said screw by the forces encountered during mixing are accommodated via said coupling means and said connecting means while said support shaft and said connecting shaft rotate at said slow speed only.

4,437,768
MOVEMENT STRUCTURE FOR AN ELECTRONIC TIMEPIECE

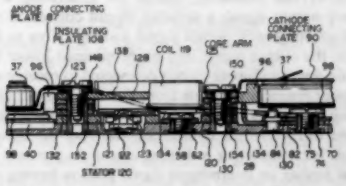
Kenji Miyasaka, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 251,812

Claims priority, application Japan, Apr. 11, 1980, 55-47565; Jul. 22, 1980, 55-99415; Jul. 22, 1980, 55-99417; Sep. 12, 1980, 55-126991

Int. Cl.³ G04C 23/02

U.S. Cl. 368—88 **20 Claims**



1. A movement structure for a miniature analog type of electronic timepiece powered by a battery and having time indicating hands, a crystal vibrator, an electronic circuit electrically coupled to said crystal vibrator for producing timekeeping signals, a time correction switch mechanism which is externally actuatable for producing correction signals to be applied to said electronic circuit unit to provide time correction signals, a stepping motor comprising a coil, a coil core, a

stator and a rotor, said stepping motor being responsive to said timekeeping signals for periodically rotating said rotor and also responsive to said time correction signals to correct time indicated by said hands, and a wheel train coupled to said rotor for transmitting the motion thereof, said movement structure comprising:

a baseplate having a central area and first, second, third and fourth areas surrounding said central area; and

a wheel train bridge positioned over said central area of the baseplate and secured to said baseplate, such as to provide a space between said wheel train bridge and said baseplate, with said wheel train being contained within said space;

said time correction switch mechanism being positioned in the first area of said baseplate, said electronic circuit unit being positioned in the second area of said baseplate, said crystal vibrator being positioned in the third area of sid baseplate, and said stepping motor being positioned in the fourth area of said baseplate, with said battery being positioned such as to substantially cover said wheel train, said electronic circuit and said crystal vibrator, and with said stepping motor coil being positioned directly above said stepping motor rotor and stator.

4,437,769

ELECTRONIC TIMEPIECE

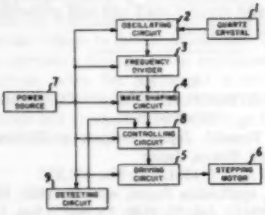
Masaharu Shida; Makoto Ueda; Shuji Otawa; Masaaki Mandai, and Katsuhiko Sato, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 168,321

Claims priority, application Japan, Jul. 13, 1979, 54-89008

Int. Cl.³ G04C *3/00*

U.S. Cl. 368—204 **16 Claims**



1. An electronic timepiece comprising: a power source; a quartz crystal oscillating circuit for generating a high frequency output signal; a dividing circuit connected to receive the high frequency output signal and operative to frequency divide the output signal into predetermined lower frequency signals; a wave shaping circuit connected to receive a plurality of lower frequency signals from the dividing circuit for producing a plurality of control signals; a controlling circuit connected to receive the control signals from the wave shaping circuit for controlling a driving circuit to produce a driving signal having an intermittent signal portion having one signal component effective when applied to the coil of the stepping motor for flowing driving current from the power source through the coil and another signal component effective to connect one terminal of the coil to the other terminal thereof so as not to make the driving current zero; a stepping motor connected to receive the drive signal from the driving circuit; and a detecting circuit for detecting the voltage output of the power source and operative to change the duty ratio of the intermittent signal portion in response to the detected output.

4,437,770

TIMEPIECE

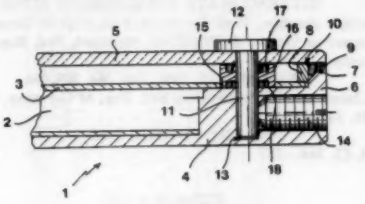
Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Longeau, Switzerland

Filed Nov. 30, 1982, Ser. No. 445,731

Claims priority, application Switzerland, Dec. 2, 1981, 7705/81

Int. Cl.³ G04B *37/00, 19/06, 37/08*

U.S. Cl. 368—294 **7 Claims**



1. A timepiece comprising a workpiece movement controlling a dial, the movement being housing in a lower part of a watch case and crystal applied over at least a portion of its periphery against an upper edge of the lower part, wherein a housing is provided below the periphery of said crystal, said housing being formed by said upper edge having a surface inclined toward the inside of the case and the surface on the periphery of the crystal opposite said inclined surface, and a gasket placed and deformably held in said housing below said periphery of said crystal.

4,437,771

METHOD AND APPARATUS FOR INDIRECT MEASUREMENT OF THERMAL ENERGY

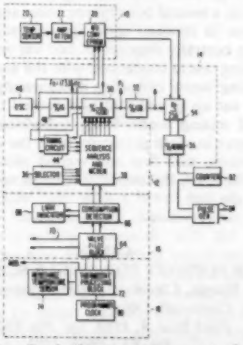
Luigi Cazzaniga, Milan, Italy, assignor to Cazzaniga S.p.A., Milan, Italy

Filed Jan. 8, 1982, Ser. No. 337,959

Claims priority, application Italy, Sep. 30, 1981, 24233 A/81

Int. Cl.³ G01K *17/06*

U.S. Cl. 374—39 **18 Claims**



1. An apparatus for indirect measurement of the thermal energy supplied to a plurality of zones by flow of a heat carrying fluid from a common heating system wherein a plurality of valves control the supply of the heating fluid to the respective zones, the apparatus comprising:

a heating fluid temperature sensor for sensing the temperature of the heat carrying fluid being distributed to the zones,

memory means containing a plurality of heat transfer coefficients which are proportional to unit heat transfer rates of

heat transfer devices in the zones relative to corresponding temperatures,

means responsive to the heat carrying fluid temperature sensor for selecting one of the memorized heat transfer coefficients,

preset heating capacity coefficient means for generating heating capacity coefficients of the corresponding

zones, and an electronic processing circuit including a frequency generator and variable multiplier means responsive to the selected heat transfer coefficient and the zone heating capacity coefficients for generating series of pulses having frequencies corresponding to heat consumption in the respective zones.

4,437,772

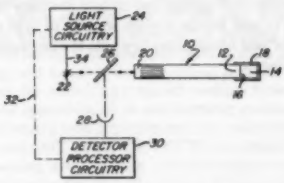
LUMINESCENT DECAY TIME TECHNIQUES FOR TEMPERATURE MEASUREMENT

Thaddeus V. Samulski, 4013 Stilwell St., Pittsburgh, Pa. 15214

Continuation-in-part of Ser. No. 73,841, Sep. 10, 1979, Pat. No. 4,245,507. This application Dec. 8, 1980, Ser. No. 213,827

Int. Cl.³ G01J *5/00, 9/00;* **G01K** *11/20*

U.S. Cl. 374—129 **29 Claims**



1. A temperature probe comprising:

an optical fiber bundle having at least one optical fiber;

a temperature sensitive luminescent element having time dependent light emission properties having at least two different time emission components, said temperature sensitive element being attached at one end of said bundle and being adapted to be implanted in such material whose temperature is to be measured;

light source located proximate the other end of said bundle, said light source having a given frequency spectrum for transient excitation of said temperature sensitive luminescent element;

means proximate said other end for separating the light passed from said source toward said temperature sensitive element from that being emitted from said temperature sensitive element; and

light responsive detection and analysis means located proximate said other end of said bundle, said light responsive detection means including means for detecting and analyzing said at least two different time emission components emitted by said temperature sensitive luminescent element as a function of the change in temperature of said temperature sensitive element.

4,437,773

QUARTZ THERMOMETER

Rudolf Dinger, St. Aubin; Jean-Georges Michel, and Claude-Eric Leuenberger, both of Neuchatel, all of Switzerland, assignors to Asulab S.A., Neuchatel, Switzerland

Filed Aug. 24, 1981, Ser. No. 295,777

Claims priority, application Switzerland, Aug. 29, 1980, 6508/80; Apr. 21, 1981, 2588/81

Int. Cl.³ G01K *11/22*

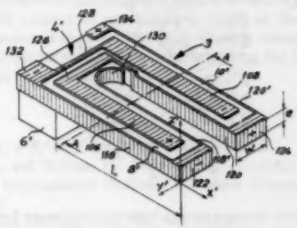
U.S. Cl. 374—117 **15 Claims**

1. A quartz thermometer comprising:

a resonator including at least one elongate element made from a quartz crystal, the length of said element being substantially parallel to the X axis of said quartz crystal, said element having two main surfaces which are substantially parallel to each other and to said length and delimited by edges, said main surfaces being perpendicular to an axis Z′ which is inclined at an angle of between +30° and −30° with respect to the optical axis Z of said quartz crystal;

at least one first group of four electrodes disposed on said element, parallel to said length, said electrodes being disposed on said two main surfaces of said element, adjacent the edges thereof;

means for applying two different voltages to two of said electrodes that are disposed on the same main surface and to two of said electrodes that are located opposite each other on different main surfaces so as to cause said element



to vibrate torsionally and to emit a signal, the frequency variations of which are a substantially linear function of temperature;

means for supporting said element for said torsional vibration; and

an electronic circuit for processing said signal emitted by said resonator, said circuit comprising:

a reference frequency oscillator; and

means for comparing the frequency of the signal emitted by said resonator and the signal emitted by said reference frequency oscillator and for producing an indication of the temperature to which said resonator is subjected from the difference between the frequencies of these signals.

4,437,774

DRILLING BIT BEARINGS

Daryl A. Schultz, R.R. 2, Box 92-A, Rensselaer, Ind. 47979

Filed Jun. 28, 1982, Ser. No. 392,992

Int. Cl.³ F16C *19/28*

U.S. Cl. 384—92 **10 Claims**

1. A drilling bit comprising a frame having a leg

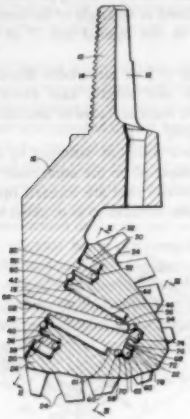
said leg having a central journal and an annular journal concentric with, radially outward of, and axially coextensive with said central journal, said central journal having an outer face and said annular journal having inner and outer faces,

a cutter rotatably mounted on said leg having an outer collar with an inner face located outward of said annular journal and an inner collar with inner and outer faces disposed between said central and annular journals,

an outer bearing means between said inner face of said outer collar and said outer face of said annular journal,

an intermediate bearing means between said inner face of

said annular journal and said outer face of said inner collar, and



an inner bearing means between said inner face of said inner collar and said outer face of said central journal.

4,437,775

DOT PRINTER HEAD

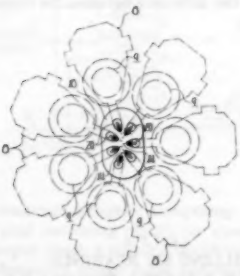
Kuniaki Ochiai, Mishima; Masami Horii, and Hidekazu Ishii, both of Shizuoka, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,284

Claims priority, application Japan, Aug. 14, 1981, 56-120894[U]

Int. Cl.³ B41J 3/12

U.S. Cl. 400—124 5 Claims



1. A dot printer head comprising:

(a) a plurality of electromagnets arranged in annular form around the central axis of the dot printer head, each of said plurality of electromagnets having an armature operatively associated therewith;

(b) a plurality of flat needle caps, each of which has an elongated cross-section in the radial direction of the dot printer head, one of said needle caps being associated with each of said plurality of electromagnets in position to be driven by the armature thereof in the direction of the axis of the dot printer head;

(c) a plurality of needles, the non-working end of each of said plurality of needles being bent in the radial direction of the dot printer head and embedded in an associated one of said needle caps, the working ends of said plurality of needles being aligned with one another and equi-distantly spaced from one another in a plane which includes the central axis of the dot printer head;

(d) a guide body which receives said plurality of needles, said guide body having a plurality of guide holes in a surface thereof perpendicular to the axis of the printer head, each of said guide holes being composed of an oval portion which extends in the radial direction of the dot printer head and which slidably receives one of said needle caps and a circular portion disposed radially outwardly of the oval portion, the circular portion of each guide hole being in communication with the oval portion of each guide hole and the diameter of the circular portion of each guide hole being greater than the width of the oval portion of each guide hole and greater than the diameter of the needle spring recited in subparagraph (f);

(e) a needle spring rest mounted in said guide body perpendicularly to the central axis of the dot printer head, said needle spring rest having a plurality of guide holes therein each of which slidably receives and guides one of said needles; and

(f) a needle spring surrounding each of said needles and bearing at one end against said needle spring rest and at the other end against one of said plurality of needle caps, each of said needle springs serving to urge the associated one of said needle caps towards the associated one of said armatures.

4,437,776

PRINTING MECHANISM

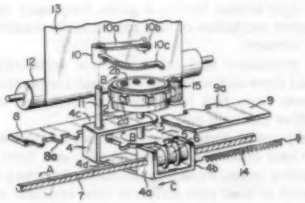
Hirofumi Hirano, Arakawa, Japan, assignor to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Filed Mar. 8, 1982, Ser. No. 356,101

Claims priority, application Japan, Mar. 30, 1981, 56-46635

Int. Cl.³ B41J 1/34

U.S. Cl. 400—142 3 Claims



1. A printing mechanism for printing characters on a recording medium, such as a paper sheet, that is fed in a feeding direction, said mechanism comprising:

a type drum mounted for rotation in a plane that extends perpendicularly to the feeding direction and for translation in a shift direction extending along a line on which characters are to be printed on the recording medium;

a plurality of character type carried on said type drum; and

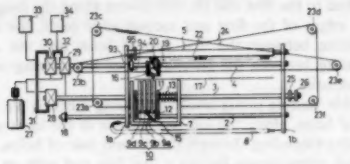
control means for simultaneously causing one of said type to strike said recording medium and translating said type drum in said shift direction, said control means comprising a pinion gear fixed to said type drum for rotation therewith and a rack gear extending in said shift direction and selectively engageable with said pinion gear, wherein said type drum is translated in said shift direction during rotation thereof when said rack gear engages said pinion gear.

4,437,777

PRINTER HAVING PLURAL TYPE WHEEL ASSEMBLY

Fumihisa Hori, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,308
Claims priority, application Japan, Feb. 2, 1981, 56-12981
Int. Cl.³ B41J *1/34*
U.S. Cl. 400—154.2 11 Claims



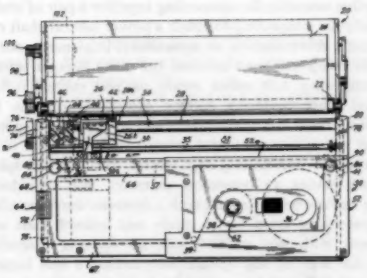
1. A printer comprising a carriage adapted to be shifted along a line to be printed and carrying a plurality of type wheels each having a plurality of type elements spaced around respective areas of its circumference, selection means connected with said type wheels for rotating them and shifting them laterally within said carriage for bringing a respective area of any one of said type wheels into a printing position, impact means including a hammer movable along a line to be printed to bring said hammer into a printing position opposite the selected area for impacting a record medium between said hammer and any type element in said printing position, carry means interconnecting said impact means and said carriage for moving them unitarily along the line to be printed, return means for returning said carriage and said impact means to their initial position for the start of printing of the next line, and control means responsive to a particular rotary position of at least one of said type wheels for operating said return means by the actuation of said carry means with said at least one type wheel being placed in said particular rotary position.

4,437,778

TAPE CASSETTE HAVING MEANS FOR ADJUSTING A TAPE SEGMENT LENGTH FOR A THERMAL PRINTER

Takao Miyashita, Atsugi; Hidekuni Aizawa, and Toru Takamiya, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,700
Claims priority, application Japan, Dec. 11, 1980, 55-178144
Int. Cl.³ B41J *33/14*
U.S. Cl. 400—208 11 Claims



1. A tape cassette for use with a printing apparatus, comprising:

housing means including a first projecting portion at one side thereof;

first and second reels rotatably mounted in said housing means;

a tape having a pigment thereon wound about said reels and having a segment extending between said reels, the length of said segment being adjustable;

tape drawing means slidably moveable within said housing means for adjusting the length of said segment and including at least one sliding member moveable within said housing means in a direction parallel to said segment of tape and having a portion thereof always positioned within said housing means and having an end section, a connecting member connected to said end section, and a second projecting portion having a free end and extending from said connecting member at an opposite side of said housing means and being substantially parallel to said first projecting portion; and

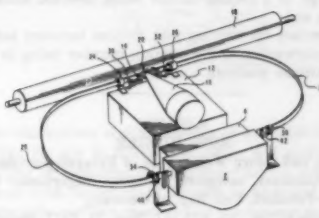
first guide means attached to said free end of the second projecting portion of said tape drawing means for slidably moving therewith in said direction parallel to said segment of tape with respect to said housing means as the tape drawing means moves within said housing means for guiding said segment of tape and for adjusting the length thereof used for printing.

4,437,779

REPLACEABLE RIBBON CARTRIDGE

Willie Goff, Jr., and William M. Jenkins, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1981, Ser. No. 335,479
Int. Cl.³ B41J *31/10*
U.S. Cl. 400—208 3 Claims



1. Apparatus for replacing an off the print element carrier ribbon supply cartridge in a printer having a movable print station comprising:

means for maintaining a portion of said ribbon external of said cartridge, said external ribbon being positioned in operative relation to the print station;

a pair of means located on either side of the cartridge for severing said external portion of ribbon from the ribbon remaining in the cartridge;

said means for maintaining comprising two flexible guide means each connected on one end to the printer adjacent one pair of said means for severing, and at the other end to said print element carrier, one on each side thereof, for movement therewith; and

means for splicing said external portion of ribbon to ribbon in a replacement cartridge.

4,437,780

CYLINDRICAL PLATEN PRINTER WITH IMPROVED PAPER GUIDE

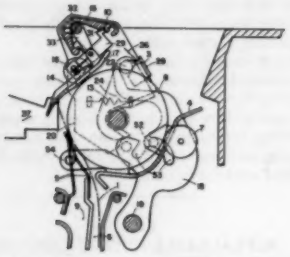
Wendelin Weber, Siegen, and Manfred Rosenthal, Kirchen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,778
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043630
Int. Cl.³ B41J *13/16*
U.S. Cl. 400—642 20 Claims

1. A printing mechanism comprising a circular cylindrical

platen defining an axial direction, means for guiding and feeding a record carrier around the platen, and a printing member mounted to be displaceable in said axial direction between extreme positions, characterized in that said means for guiding and feeding comprises:

a plurality of hold-down devices movable in a direction substantially tangential to the platen surface, and transverse to said axial direction, between an engaging position and a deflecting position, in said engaging position said



devices engaging the platen such as to hold an inserted record carrier against the platen, in said deflecting position said devices being lifted off the printing platen and forming guides which define a path followed by the leading edge of a record carrier being inserted around the platen, and

control means for moving said devices between said positions, responsive to the printing member being in one of said extreme positions.

4,437,781

RING BINDER

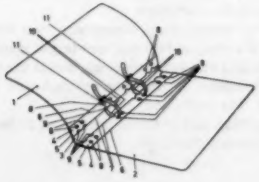
Rolf Weihe, and Georg Weihe, both of Kreuztal-Ferndorf, Fed. Rep. of Germany, assignors to Siplast Siegerländer GmbH, Kreuztal-Ferndorf, Fed. Rep. of Germany

Continuation of Ser. No. 853,101, Nov. 21, 1977, abandoned, which is a continuation of Ser. No. 777,316, Mar. 14, 1977, abandoned, which is a continuation of Ser. No. 596,831, Jul. 17, 1975, abandoned, which is a continuation of Ser. No. 433,867, Jan. 16, 1974, abandoned. This application May 6, 1982, Ser. No. 375,561

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1973, 2302365

Int. Cl.³ B42F *13/00, 13/06*

U.S. Cl. 402—8 **5 Claims**



1. A ring binder for perforated paper stock comprising:

(a) a first cover having exterior and interior surfaces and an inner edge,

(b) a second cover having exterior and interior surfaces and a inner edge spaced from the inner edge of the first cover,

(c) a back part of flexible sheet material connecting the first and second covers and forming a flexible back strip which spans the space between inner edges of the first and second covers for allowing the covers to move between an open coplanar position and a closed, generally spaced, parallel position, said back part overlapping the back surface of the first cover to form a first edge part adjacent the inner edge thereof and overlapping the back surface of the second cover to form a second edge part adjacent the inner edge thereof, said first cover having a first pair of holes at said first part, said second cover having a second pair of holes at said second edge part, said first and second pairs of holes being located along a line which extends transversely across said back part, said back part being attached to the first and second covers along the longitudinal edges of the first and second edge parts, the area extending between the first pair of holes and the area extending between the second pair of holes being unattached, and

(d) flexible binding prong means extending through the first pair of holes, along the interior surface of the back part, and also extending through the second pair of holes, the binding prong means having a first free end with an eye for receiving a second free end of the prong means to allow for sliding engagement of the prong means through the eye to form a closed loop.

4,437,782

SPLINED HUB ASSEMBLY FOR CONNECTING TWO SHAFTS

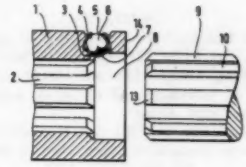
Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Dec. 29, 1982, Ser. No. 454,233

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200846

Int. Cl.³ F16D *1/12*

U.S. Cl. 403—13 **4 Claims**



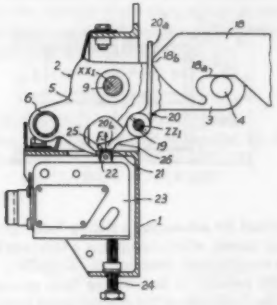
1. A spline assembly for connecting together a pair of shafts, particularly for connecting together a power takeoff shaft of a tractor and a drive shaft of an agricultural implement, one of said shafts being a splined hub and the other being a splined shaft, comprising: hub spline means on said splined hub; a cylindrical inner centering surface extending between the termination of said hub spline means and an end of said splined hub; shaft spline means on said splined shaft arranged to be placed in torque-transmitting engagement with said hub spline means and having an outermost diameter, said cylindrical centering surface being formed with a diameter corresponding to said outermost diameter to guide said splined shaft into engagement with said splined hub; an opening extending through the wall of said splined hub having a ball located therein, said ball being arranged to have a segment thereof project inwardly into said hub to effect engagement of said ball with said splined shaft; said opening being positioned relative to said hub spline means so that said ball will engage between said shaft spline means when said splined shaft is arranged in engagement with said splined hub with the axial distance between the center of said opening and said end of said splined hub being equal to or smaller than the axial length of said cylindrical inner centering surface.

4,437,783

DEVICE FOR THE DETECTION OF THE POSITION OF THE THRUST REVERSER OF A TURBOJET ENGINE

Yves R. Halin, Melun, and Rene M. J. Hersen, Combs la Ville, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, S.N.E.C.M.A., France

Filed Jul. 27, 1981, Ser. No. 286,886
Claims priority, application France, Aug. 11, 1980, 80 17640
Int. Cl.³ F16B *1/00*
U.S. Cl. 403—27 5 Claims



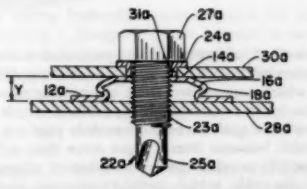
1. A device to detect the position of a thrust reverser of a turbojet engine and its locking means, having a hook element integral with a moving part of the thrust reverser which moves in rectilinear translation, mechanical locking means and a stationary electric detection means for detecting the position of the hook element with respect to the mechanical locking means comprising: (a) a stationary support element; (b) locking means pivotally mounted on the stationary support element so as to pivot about a first axis, the locking means having an arm extending therefrom on one side of the first pivot axis, a strap extending therefrom on the opposite side of the first pivot axis, and an axle mounted on the strap so as to be engageable with the hook element; (c) control means connected to the arm to pivot the locking means about the first pivot axis; and (d) a lever pivotally mounted on the locking means to pivot about a second pivot axis which extends parallel to the first pivot axis, the lever having a first lever arm extending into the path of movement of the hook element and a second lever arm which actuates the electric detection means such that when the thrust reverser is in its locked position the hook element contacts the first lever arm to actuate the electric detection means.

4,437,784

ADJUSTABLE SHIM SYSTEM

Francis C. Peterson, St. Charles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 28, 1982, Ser. No. 343,623
Int. Cl.³ F16B *37/02*
U.S. Cl. 403—408 4 Claims



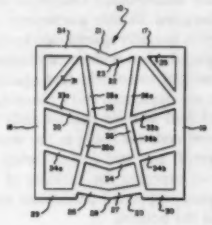
1. An adjustable shim device for use in accurately controlling the distance between a support structure and a workpiece to be fastened to the support structure, the device including a pair of spaced flange means creating a first coplanar surface for welding to a support structure and an imperforate second web section to be perforated by a self drilling threaded fastener integrally connected to the first surface by strut means, said second web section being generally parallel with said first surface, said strut means extending on both extremities of said spaced flange means interconnecting the flanges with the imperforate second web section, the strut means including a knee-like joint which includes a bend line about which the strut can be transformed to change the spatial relationship between the first section and second surface in a predetermined but accurately controlled fashion.

4,437,785

ELASTOMERIC SEALING MEMBER

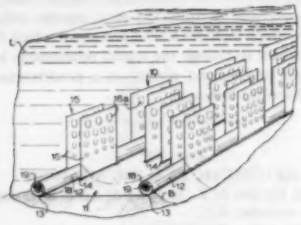
Guy S. Puccio, Snyder, N.Y., assignor to Acme Highway Products Corp., Amherst, N.Y.

Filed Jan. 25, 1983, Ser. No. 460,923
Int. Cl.³ E01C *11/10*
U.S. Cl. 404—64 18 Claims



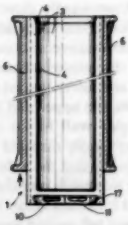
1. An elastomeric sealing member positionable in an expansion joint for use in sealing the same, said sealing member comprising an elongated tubular body having a length commensurate with the length of the joint to be sealed and having a substantially uniform cross section throughout its length and a plurality of interconnecting internal support members for providing support to said body and for controlling resistance to compression thereof in a direction transverse to its length, said body including a top wall, a bottom wall, and a pair of opposed side walls, each of said side walls being adapted to bear tightly against the sides of said joint, each of said top and bottom walls including downwardly directed V-shaped portions which cause deflection of the associated wall to occur in a downward direction when transverse compression forces are applied to the side walls, the interconnecting internal support members including upper and lower spaced apart ribs and right and left spaced apart struts, the upper and lower spaced apart ribs extending from one side wall to the other and each rib including a generally downwardly directed V-shaped element, the ends of the upper ribs joining the side walls at locations above the midpoint of the side walls and the ends of the lower rib joining the side walls at locations below the midpoint of the side walls, and the right and left spaced apart struts extending between the top wall and the bottom wall, each strut including upper and lower generally straight portions, the upper ends of the upper portions joining the top wall at spaced apart locations and the lower ends of the upper portions joining the upper rib at spaced apart locations between the ends thereof, the spacing between the upper ends of the upper portions of the spaced apart struts either being the same or slightly greater than the spacing between the lower ends of the upper portions, and the lower portions of the struts extending downwardly and outwardly from the upper rib to locations intersecting the bottom wall, the spacing between the upper ends of the lower portions of the spaced apart struts being less than the spacing between the lower ends of the lower portions.

4,437,786
ARTIFICIAL SEAWEED
John P. Morrisroe, 283 Park Dr., Palatine, Ill. 60067
Filed Jul. 6, 1982, Ser. No. 395,618
Int. Cl.³ E02B 3/04
U.S. Cl. 405—24 15 Claims



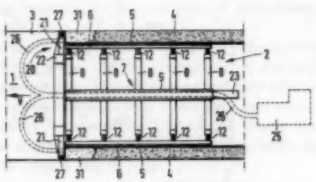
1. Artificial seaweed for deployment on lake bed bottoms and the like to build thereon deposits from particulate material suspended in the water which comprises an anchor having a plurality of elongated flexible particulate material receiving tubes positioned in laterally spaced side-by-side relation, means spanning the spaced tubes connected thereto along the length thereof and arranged to be held taut against the lake bottom when the tubes are deployed, and a plurality of rows of buoyant fingers anchored at their bottom ends to said means and having free upper ends for rising in the water to levels below the surface thereof, and said fingers being spaced apart in a plurality of rows exposing the surfaces of the fingers to the water for trapping suspended particulate material to build up said deposits on the bottom.

4,437,787
PLASTIC CHEESE MOLD
Dirk C. H. van der Ploeg, Oud-Beyerland, and Hendrikus M. Tameris, Rotterdam, both of Netherlands, assignors to Albany International Plastic B.V., Netherlands
Filed Sep. 30, 1982, Ser. No. 429,450
Int. Cl.³ B29C 1/00, 15/00; A01C 25/13
U.S. Cl. 425—84 8 Claims



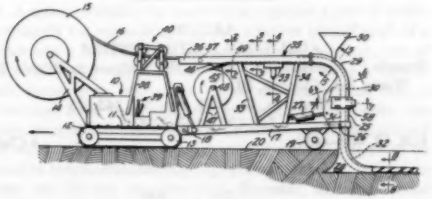
1. A cheese mold of plastics material comprising: at least two matching shells each having an integral bottom member, said two shells and the bottom members when coupled together forming a hollow mold having a substantially constant integral cross-section along its length and with a bottom closure, said shells having a moisture permeably layer securely attached to their inner walls, said mold having at least one outlet opening for removing whey; said bottom members having a hinged connection therebetween and having adjacent thereto an annular recess and a hollow follower container member having edges frictionally engaged with said mold in said annular recess.

4,437,788
METHOD AND APPARATUS FOR THE ADVANCING OF A SLIDING FORM
Heinz T. Walbröhl, Nordstrasse 75, Bonn 1, Fed. Rep. of Germany (5300)
Filed Nov. 16, 1981, Ser. No. 321,487
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1980, 3043312
Int. Cl.³ E21D 11/04
U.S. Cl. 405—146 22 Claims



1. A method for advancing a sliding form upon the lining of a gallery or tunnel, which comprises a formwork body extending in the longitudinal direction of the gallery or tunnel and substantially parallel to its working face, an end form which closes off the front side of the annular space contained between the working face of the gallery or tunnel or an outer shell arranged there and the formwork body and a supporting structure which bears at least the formwork body, characterized by the fact that, at least in the region of the roof of the gallery or tunnel, the parts of the formwork body which are filled at the back with liquid concrete and the parts of the formwork body which rest against concrete which has not yet hardened, are rigidly supported on the supporting structure and that, after sufficient hardening of the concrete, transfer is effected to an elastic supporting of the formwork body on the supporting structure.

4,437,789
METHOD AND MEANS FOR PROTECTING BURIED CABLE FROM RODENT DAMAGE
Allen B. Kasiewicz, Rumson, N.J., assignor to GK Technologies, Incorporated, Greenwich, Conn.
Filed Sep. 24, 1981, Ser. No. 305,359
Int. Cl.³ E02D 29/10; F16L 1/02, 57/00
U.S. Cl. 405—156 16 Claims



1. The method of laying rodent-protected cable from a forwardly moving vehicle having (1) a cable supply-reel support from which unprotected cable can be continuously paid out and (2) a sheath-material reel support from which a strip of flexible sheath material can be continuously paid out, the strip being of width between lateral edges more than sufficient to circumferentially envelop the cable at desired ultimate radial offset from the cable, which method comprises continuously paying out from said supports a supply of cable and a supply of sheath material at a rate coordinated with forward movement of the vehicle, supporting the sheath material at substantially said offset beneath the cable and for a predetermined longitudi-

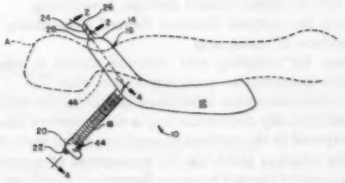
nal zone of travel of cable and sheath material, the sheath entering said zone in substantially flat condition and being formed into upwardly dished enveloping contour around the cable as it travels through said zone, centrally supporting the cable with respect to the progressively enveloping sheath, completing the sheath-envelopment of the cable by lapping the edges of the sheath, admitting a continuous flow of hardenable cementitious material between lateral edges of the sheath to fill the sectional area defined by the sheath just prior to sheath-edge lapping to complete the envelopment, and guiding the thus-filled and ensheathed cable to ground-supported at-rest position behind the vehicle while the vehicle is moving forward, whereby the cementitious material may harden in situ to become a rodent-protective sheath.

4,437,790

BUOYANCY COMPENSATOR

Timothy N. Trop, 139 Elmwood Dr., Naperville, Ill. 60540

Filed Sep. 24, 1982, Ser. No. 423,221
Int. Cl.³ B63C *11/18, 11/02*
U.S. Cl. 405—186 **21 Claims**



1. A buoyancy compensator, comprising:

an enclosure for containing air including a vest portion adapted to be worn on the user's chest and a back portion adapted to be encircle the back of the user;

an inflation means for allowing the user to inflate said enclosure, said inflation means including an elongate hose in fluid communication with the interior of said enclosure, said inflation means further including a manually operable valve for controlling the fluid flow through said hose;

an exhaust means for exhausting air from said enclosure, mounted on said enclosure and communicating with the interior of said enclosure, said exhaust means including a valve operable to release air under pressure from said enclosure; and

means for automatically opening said exhaust means valve when said inflation hose is extended forcefully away from the user.

4,437,791

CLAMP FOR HYDRAULIC HOSE BUNDLES

Graeme E. Reynolds, 10859 Church La., Houston, Tex. 77043

Filed Apr. 2, 1982, Ser. No. 364,998
Int. Cl.³ E02B *3/00*
U.S. Cl. 405—195 **11 Claims**

1. In a marine hydraulic control system for an offshore oilwell platform, a clamping device adapted to secure a hydraulic hose bundle to a tubular riser system, said hydraulic hose bundle extending between the well platform and a subsea control pod, comprising:

a generally cylindrical clamping body having an axial passage through said body for receiving such a hydraulic hose bundle;

said clamping body being formed of first and second generally semi-cylindrical body members, each of said first and second body members having a semi-cylindrical interior wall portion;

pivotal mount means operably connected with said first and second members and mounting said first and second body members for pivotal movement between an open position and a closed position;

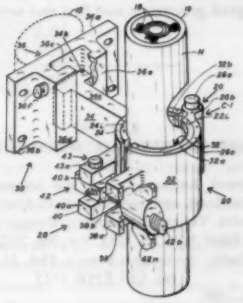
first clamping means mounted with said first and second body members for securing said first and second body members in said closed position about such hydraulic hose bundle with said interior wall portions of said body members in secure engagement with such hydraulic hose bundle;

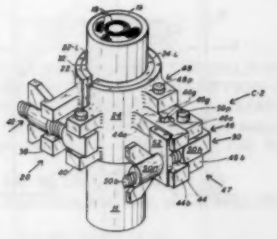
second clamping means mounted with one of said first and second body members independently of said first clamping means and extending laterally from said one body member for removably attaching said generally cylindrical clamping body to said tubular riser system;

said second clamping means including an arm formed extending laterally from said body member, said arm having at its outer end a base member wider than said arm;

tubular riser system mount means adapted for attachment to said tubular riser system; and

said tubular riser system mount means having a groove formed therein for receiving said base member of said arm





to removably attach said clamping body to the tubular riser system.

7. In a marine hydraulic control system for an offshore oilwell platform, a clamping device adapted to secure a hydraulic hose bundle to a wireline extending between the well platform and a subsea control pod, comprising:

a generally cylindrical body having an axial passage through said generally cylindrical body for receiving such a hydraulic hose bundle;

said generally cylindrical body being formed of first and second generally semi-cylindrical body members, each of said first and second body members having a semi-cylindrical interior wall portion;

pivotal mount means operably connected with said first and second body members and mounting said first and second body members for pivotal movement between an open position and a closed position;

first clamping means mounted with said first and second body members for securing said first and second members in a closed position about such hydraulic hose bundle with

said interior wall portions of said body members in secure engagement with such hydraulic hose bundle;

second clamping means mounted with one of said first and second body members independently of said first clamping means and extending laterally from said one body member for releasably attaching said generally cylindrical clamping body to such wireline extending between the well platform and subsea control pod;

second clamping means including a first yoke extending laterally from said one body member and having a groove to receive the wireline;

a second yoke and yoke mount means attached to said body and mounting said second yoke for pivotal movement with respect to said first yoke, said second yoke having a groove alignable with said groove in said first yoke, the combined size of said alignable grooves being sufficient to cause a bulge in such cable to prevent relative movement of said cable; and

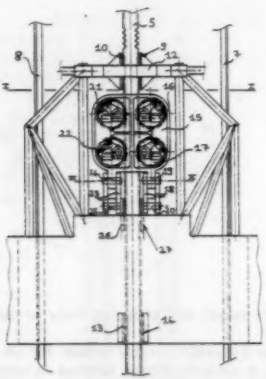
yoke connector means for releasably connecting said first and second yoke together with the wireline positioned in said aligned grooves in said first and second yokes.

4,437,792

VERTICALLY MOVING PLATFORM SUPPORTED ON LEGS

Francois Durand, Antibes, France, and Auguste Smulders, Geneva, Switzerland, assignors to Societe Anonyme Engrenages et Reducteurs, Velizy Villacoublay, France; a part interest

Filed Aug. 13, 1981, Ser. No. 292,695
Claims priority, application France, Oct. 13, 1980, 80 21804
Int. Cl.³ E21B *7/12*
U.S. Cl. 405—198 **2 Claims**



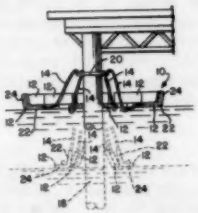
1. In a platform having legs vertically movable relative to the platform, each leg having a double rack thereon and two rows of pinions one engageable with each rack of one of the legs; the improvement comprising a pinion carrier for each row of pinions, a link for each pinion carrier, each link being pivotally connected at one end to the platform and at the other end to its associated said pinion carrier, the links being located substantially in the medial plane of the teeth of the racks and pinions, and means detachably interconnecting the lower ends of the legs for vertically swinging movement about horizontal axes relative to the platform in raised positions of the legs, said axis being parallel to but spaced from the plane defined by the teeth of said double rack, whereby rotation of the corresponding pinions swings the leg vertically about said axis.

4,437,793

PROTECTING MEANS

Allan H. Meny, 1 Hoover St., North Arlington, N.J. 07032, and Dennis L. Palmer, 61 Douglas Dr., Towaco, N.J. 07082

Filed May 4, 1982, Ser. No. 374,731
Int. Cl.³ E02B *3/22*
U.S. Cl. 405—212 **11 Claims**



1. Means for protecting a water-bound and partially water-submerged object, such as a boat, pile, float, pillar, or the like, from ice- or impact-caused damage, comprising:

means for buoyant flotation thereof substantially upon the surface of water; and

means for coupling said flotation means in spaced-apart circumjacency to such object; wherein

said flotation means comprises means (a) for defining, and substantially circumscribing, a water-surface area which is exposed to the ambient atmosphere about such object, and (b) which is yieldable, (1) in response to a pressured engagement thereof by an ice formation, to enlarge said area, and (2) to exhibit resilient deformation upon being impacted; and

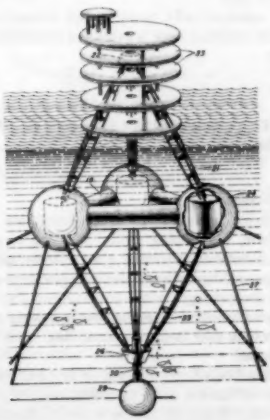
said flotation means comprises a plurality of individual flotation devices, each one of said flotation devices having means for tethering thereof separately to such object.

4,437,794

PYRAMIDAL OFFSHORE STRUCTURE

R. Leroy Grimsley, and Len J. Gawel, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 29, 1981, Ser. No. 229,425
Int. Cl.³ B63B *35/44*
U.S. Cl. 405—224 **16 Claims**



1. An offshore support structure comprising

(a) a substantially horizontal flotation adjustable section

containing at least 3 flotation adjustable members, each of said members having means to adjust its buoyancy, wherein each of said members is connected at each end to other flotation adjustable members wherein each connection of members form an apex point,

(b) at least 3 upper support members connected at the lower end thereof to the horizontal flotation adjustable section at the apex points thereof, wherein all upper support members substantially mutually join to form a common upper apex, wherein the geometric configuration of any 2 adjacent upper support members and the horizontal flotation adjustable center section forms an isosceles triangle, and

(c) at least one substantially horizontal platform connected to and supported by said upper support members at a level above the water line.

4,437,795

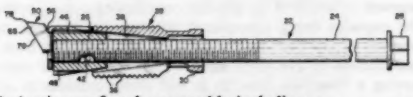
MINE ROOF ANCHOR ASSEMBLY

Claude C. White, Birmingham, Ala., assignor to Birmingham Bolt Company, Birmingham, Ala.

Filed Nov. 2, 1981, Ser. No. 317,490

Int. Cl.³ E21D *21/00, 20/02*

U.S. Cl. 405—259 **10 Claims**



1. A mine roof anchor assembly including

(a) an elongated bolt having a head at one end and threaded for a portion of its length at the other end

(b) an expansion anchor mounted on the threaded end of said bolt

(c) said expansion anchor including a wedge member threadedly engaged with the threaded end of said bolt, and an expansion member through which said wedge member passes to urge said expansion member into gripping engagement with the mine roof

(d) said expansion anchor further including a bail member secured to one end of said expansion member

(e) said bail member including a first upwardly extending portion and a second portion extending inwardly from the upper end of said first portion and in overlying relation to said wedge member, to limit the upward movement of said elongated bolt relative to said expansion member, and

(f) mine roof-engaging means carried by the inwardly extending second portion of said bail member

(g) said mine roof-engaging means and bail member being deflected in a direction to urge the former into impinging engagement with the mine roof under force of said elongated bolt engaging the inwardly extending second portion of said bail member.

4,437,796

PNEUMATIC TRANSPORT PROCEDURE AND APPARATUS

Leon Ulveling, Howald; Edouard Legille, Luxembourg, and Jean Boever, Bergem, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Jun. 11, 1980, Ser. No. 158,612

Claims priority, application Luxembourg, Jun. 15, 1980, 81388

Int. Cl.³ B65G *53/66*

U.S. Cl. 406—25 **21 Claims**

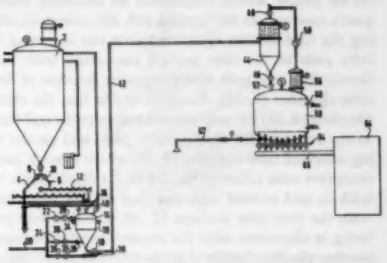
1. A method for transferring a controlled quantity of pulverized material from a storage container at atmospheric pressure into a pressurized container, comprising the steps of:

delivering pulverized material from the storage container into a first receptacle;

continually measuring the weight of material delivered into the first receptacle and terminating the delivery of material from the storage container when a pre-selected quantity of the material is present in the first receptacle;

isolating the first receptacle from the storage container subsequent to termination of the delivery of pulverized material thereto;

introducing a pressurized gas to said first receptacle and coupling the discharge from said first receptacle to a source of pressurized gas to pneumatically transfer the contents of the first receptacle into a second receptacle during the isolation of the first receptacle from the storage container;



isolating the second receptacle from the first receptacle when the contents of the first receptacle have been transferred thereto;

pressurizing the second receptacle subsequent to the isolation thereof from the first receptacle;

causing the material in the pressurized second receptacle to flow into a feed chamber in which an intermediate pressure is maintained between the pressure in said second receptacle after pressurization thereof and the pressure in said pressurized container; and

delivering the material from the feed chamber to a pressurized container.

4,437,797

PNEUMATIC MAIL STATION FOR THE DELIVERY, PNEUMATICALLY DECELERATED RECEPTION AND TRANSIT OF PNEUMATIC DISPATCH CASES

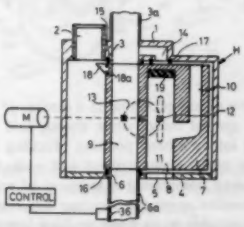
Hans J. Kardinal, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,420

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3102248

Int. Cl.³ B65G *51/32*

U.S. Cl. 406—110 **21 Claims**



1. A pneumatic mail station for the transmission, reception and transit of pneumatic dispatch cases, comprising two tube sections for coupling with an incoming and an outgoing forwarding tube path, wall means providing mutually opposite

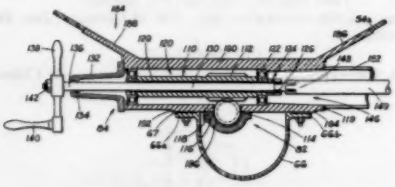
limiting walls of the pneumatic mail station at which the respective tube sections are located, said wall means having an inward transfer opening means for pneumatic dispatch cases to be sent out and an outward transfer opening means for received pneumatic dispatch cases at the same limiting walls, carrier means disposed between the limiting walls and having a reception tube chamber (8, 23) for the reception of pneumatic dispatch cases which can be introduced into alignment with the tube section associated with the incoming forwarding tube path, said reception tube chamber (8, 23) having closure means effective at one end of the reception tube chamber for creating an air pillow which decelerates an incoming pneumatic dispatch case and an air conduit (10, 20) pneumatically connecting the tube section associated with the incoming forwarding tube path to the tube section associated with the outgoing forwarding tube path in the reception position of the reception tube chamber (8, 23), characterized in that the reception tube chamber (8, 23) has said closure means at the end thereof closer to the outgoing forwarding tube path, said carrier means having a second tube chamber (9, 22) which extends parallel to the reception tube chamber (8, 23) and is displaceable in common with it, said second tube chamber (9, 22) being in alignment with the two tube sections (3, 29; 6, 30) in one position and being in alignment with the inward transfer opening means in another position; and in that the air conduit (10, 20) joins at one end with the reception tube chamber (8, 23) and can be displaced in common with said reception chamber (8, 23) and the second tube chamber (9, 22) in such manner that, given the position of the second tube chamber (9, 22) in alignment with the two tube sections, the communication of the air conduit (10, 20) at least with the tube section (3, 29) associated with the outgoing forwarding tube path is blocked but, in contrast thereto, is released at the position of the reception tube chamber (8, 23) in alignment with the two tube sections.

4,437,798

VALVE FOR DISCHARGE OUTLET AND ACTUATING MEANS THEREFORE

Dennis J. Schipper, St. Charles, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,052
Int. Cl.³ B65G *53/46*
U.S. Cl. 406—119 **15 Claims**



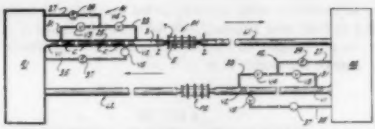
1. Valve means provided in a discharge opening defined by laterally spaced outlet slope sheets; said valve means being movable into a closed position blocking communication between an outlet compartment and a discharge conduit; said valve means comprising a segment of an arc which in said closed position spans the distance between outlet slope sheets and is roatatable to an open position located generally below one of said outlet slope sheets; said arcuate segment being actuated by a gear means engaging said segment at an area located generally in the mid-portion of said arcuate segment; said gear means attached to actuating means extending to at least one side of the outlet.

4,437,799

PIPELINE TRANSPORTATION SYSTEM

Henry Liu; Donald L. Gibson; David H. S. Cheng, and James E. Rathke, all of Columbia, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 839,254, Oct. 4, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,493
Int. Cl.³ B65G *51/04*
U.S. Cl. 406—198 **1 Claim**



1. In a hydraulic capsule pipelining system comprising a pipeline adapted for flow therethrough of a carrier liquid, and cargo-carrying capsules adapted to be transported through the pipeline by the carrier liquid, and cargo-carrying capsules adpated to be transported through the pipeline by the carrier liquid flowing through the pipeline; means for pumping the carrier liquid through the pipeline in the direction for transport of the capsules, said pumping means comprising at least one segment of length of the pipeline constituting a pump cylinder, the capsules being transported through the pipeline being adapted to pass endwise through said pump cylinder from one end thereof to the other and at least some of the capsules having a relatively close fit in said pump cylinder to act as pistons in said pump cylinder for pumping the carrier liquid through the pipeline in the direction for transport of the capsules, and means for driving said close-fitting capsules acting as pistons through said pump cylinder in said direction for pumping the carrier liquid in said direction, said driving means comprising electrically energized means along said pump cylinder for producing an electromagnetic field in said pump cylinder for linear propulsion of said close-fitting capsules acting as pistons through said pump cylinder in said direction in response to said field, said close-fitting capsules acting as pistons forcing the carrier liquid ahead of them through the pump cylinder as they are driven through said pump cylinder by said driving means, said driving means comprising coil means surrounding said cylinder and means for supplying said coil means with multiphase alternating current, at least the surface of the capsules acting as pistons being electrically conductive, the driving means acting as a linear induction motor for propulsion of the capsules acting as pistons through the cylinder, said pump cylinder being electrically nonconductive, of short length relative to the overall length of the pipeline, its internal diameter being smaller than the internal diameter of the pipeline and such as to provide a relatively close fit for the capsules acting as pistons, and there being a gradual transition from the internal diameter of the pipeline to the internal diameter of the cylinder at the inlet end of the cylinder, each capsule being formed to act as a piston in the cylinder and comprising a cargo-carrying cylindrical container of ferromagnetic material covered on the outside with a material of higher electrical conductivity.

4,437,800

CUTTING TOOL

Masatada Araki, Handa, and Yukio Tanaka, Aichi, both of Japan, assignors to Nippon Oil and Fats, Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,108
Claims priority, application Japan, Sep. 3, 1980, 55-121200
Int. Cl.³ B23G *1/20*
U.S. Cl. 407—119 **2 Claims**

1. A cutting tool consisting of a plate-shaped body comprising a sintered cermet layer and a sintered body layer containing high density boron nitride or diamond, said sintered cermet

layer constituting the center portion of the plate-shaped body and being surrounded and adhered at the side surface or at the

side surface and upper and lower surfaces with the sintered body layer.

4,437,801

HIGH TORQUE CHUCK ASSEMBLY AND COLLET

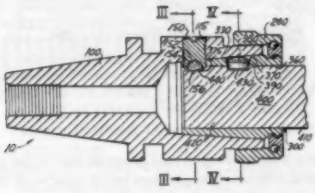
David L. Lewis, Darien, Ill., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 2,118, Jan. 9, 1979, Pat. No. 4,266,895. This application Sep. 2, 1980, Ser. No. 183,489

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.³ B23C *5/26*; B23B *31/04*

U.S. Cl. 409—232 **3 Claims**



1. A chuck assembly for securely but releasably retaining a cutting tool centered within the chuck assembly comprising:

a chuck body having an outer surface a rearwardly tapering internal bore and a radial aperture extending through the body between the outer surface and the internal bore;

a rearwardly tapering compressible collet mounted within the internal bore of the chuck body, said collet including a tool-receiving bore extending axially through the collet and a transverse bore extending between the outer surface of the collet and the axial collet bore for securely retaining and centering the tool within the chuck body's internal bore;

means for mounting the collet within the internal bore of the chuck body and for compressing the compressible collet to secure the tool centered therein by urging the collet and tool rearwardly into tight engagement with the rearwardly tapering internal bore of the chuck body;

means coupled to said collet, but not to the chuck body, for releasably retaining a tool within said axial collet bore when said tool is mounted within said compressible collet which is in turn mounted and compressed within internal bore of the chuck body; and

means for securing the chuck body directly to the tool when mounted within the tool-receiving bore of said collet, said means including a member coupled to the chuck body and passing through the collet to engage the tool.

4,437,802

BORING TOOL HAVING A DETACHABLE CUTTING BLADE

John J. Hall, Jr., 13 Ridgwood Rd., Wallingford, Conn. 06492

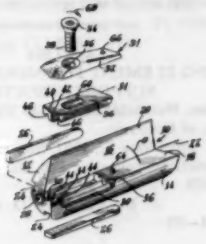
Filed Sep. 14, 1981, Ser. No. 302,165

Int. Cl.³ B23B *41/02*; B26D *1/12*

U.S. Cl. 408—197 **7 Claims**

1. A boring tool comprising:

a cylindrical head having a front end and a cylindrically shaped outer surface, said head including a groove for removing chips extending longitudinally rearwardly from said front end and being open radially to said outer surface, said groove including a planar surface having a recess therein for receiving a detachable cutting blade, said recess having a floor extending longitudinally rearwardly from said front end to a stop surface at the rear thereof for preventing rearward movement of said blade, said recess extending radially outwardly to the outer surface of said head, said blade having an interior surface for seating on said recess floor and having a cutting edge protruding from the front end of said bead, said interior blade surface and said floor including at least one mating



protrusion and slot extending longitudinally for permitting longitudinal advancement of said blade surface with respect to said floor and for retaining said seated blade against radial outward movement, and including a plate for releasably securing said blade against transverse movement out of said recess, said blade including an outer surface that is substantially flush with said groove surface, said plate being positioned in overlying relationship adjacent said blade outer surface and said groove surface, said plate being held in place by releasable fastening means.

4,437,803

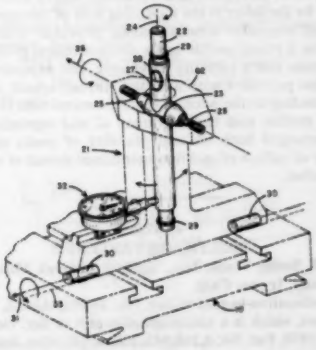
SPINDLE SQUARING TOOL

William M. Volna, 1808 Quincy St. NE., Minneapolis, Minn. 55418

Filed May 10, 1982, Ser. No. 376,565

Int. Cl.³ B23C *9/00*; B23Q *17/16*

U.S. Cl. 409—218 **11 Claims**



1. An instrument for measuring and squaring the spindle and collet of a vertical milling machine to be perpendicular with the machine table or work surface comprising

(a) a first cylinder member adapted for securing along an axis coaxial to said spindle with said collet, having a portion thereof protruding from said collet;

(b) a pivotal second member that contains a portion of said first member which protrudes from said collet, said second member having rotational and axial freedom relative

to said first member and with negligible radial clearance about said first member, and said second member having a pivotal axis which is perpendicular to the axis of said first member;

(c) a main frame which supports said second member along said pivotal axis of said second member, said main frame having at least two surface contact points along a line that defines an axis which is perpendicular to said pivotal axis of said second member; and

(d) an indicator affixed between said main frame and said pivotal second member to quantify relative motion about said pivotal axis of said second member.

4,437,804

MOUNTING ELEMENT FOR MOUNTING OBJECT TO SUPPORT STRUCTURE

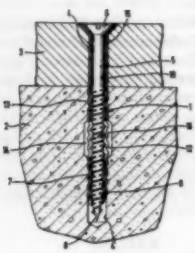
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, Tumlingen, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,354

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022458

Int. Cl.³ F16B *13/14*

U.S. Cl. 411—59 **15 Claims**



1. A mounting element for mountin an object on a support structure having a mounting hole, comprising an elongated expansion sleeve member insertable into a mounting hole of a support structure and having a longitudinal opening; and an elongated expander member insertable into said longitudinal opening so as to expand said expansion sleeve member and to thereby fix the latter in the mounting hole of the support structure, said expander member being provided with a thread which has a round profile and a predetermined pitch, a plurality of peaks and a plurality of valleys, said expander member being also provided with a further thread which has a pitch corresponding to the pitch of said first-mentioned thread and a pointed profile, said further thread of said expander member being arranged both on said plurality of peaks and in said plurality of valleys of said first-mentioned thread of said expander member.

4,437,805

MULTIGRIP FASTENER

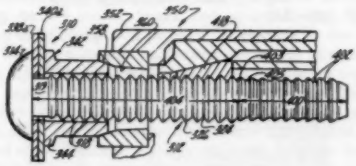
Walter J. Smith, Waco, Tex., assignor to Huck Manufacturing Company, Irvine, Calif.

Continuation-in-part of Ser. No. 26,652, Apr. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 899,591, Apr. 24, 1978, Pat. No. 4,208,943. This application Jan. 26, 1981, Ser. No. 228,600

Int. Cl.³ F16B *19/00*

U.S. Cl. 411—361 **8 Claims**

1. In a two piece fastener for fastening a plurality of workpieces together with the workpieces having a thickness varying from a determinable minimum to a determinable maximum thickness, comprising a pin member having a head and a shank portion having a plurality of grooves thereon and a tubular member adapted to be swaged into locking engagement with a predetermined number of the grooves on the shank portion of the pin member by means of a tool having a swaging anvil adapted to engage the tubular member and gripping means adapted to grip a gripping portion of the shank portion, the gripping means including a plurality of jaw members having a plurality of teeth with a preselected pitch, the tool being actuable to apply a relative axial tensile force between the pin member and the tubular member whereby the tubular member is swaged into the predetermined number of the grooves on the shank portion of the pin member, the improvement comprising said pin member with at least said predetermined number of said combination grooves being annular combination locking and breakneck grooves, each of said predetermined number of said combination grooves being defined by first and second radially outwardly diverging sidewalls, said first sidewall being positioned closer to said head than said second sidewall, a selected one of said combination grooves being located at a predetermined location proximate the outer end of the tubular member and adapted to receive the material of the tubular member as it is swaged onto the shank portion whereby the



shank portion will fracture at said selected one of the grooves, any one of said combination grooves being capable of functioning as said selected one of said combination grooves when located at said predetermined location while said pulling tool exerts the relative axial tensile force on said pin member, said gripping portion of the shank portion located at the end opposite side head and having a plurality of different grooves adapted to be gripped by the gripping means of the tool, said different grooves having a shape different from that of said combination grooves whereby said different grooves will not effectively function as a breakneck groove, said combination grooves and said different grooves having the same pitch as said preselected pitch whereby said teeth can engage both said combination grooves and said different grooves separately or simultaneously said combination grooves and said different grooves having substantially no transition portion at the area of their juncture such that the last of said combination grooves and the first of said different grooves are separated by said preselected pitch.

4,437,806

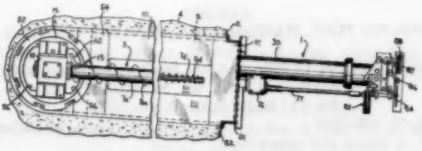
OVERLOAD MECHANISM FOR THE SYSTEM OF A BOTTOM SILO UNLOADER

George E. Olson, Arlington Heights, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Division of Ser. No. 205,461, Nov. 10, 1980, Pat. No. 4,386,695. This application Sep. 27, 1982, Ser. No. 424,414

Int. Cl.³ B65G *65/46*

U.S. Cl. 414—307 **4 Claims**



1. In a bottom silo unloader mechanism, a sweep auger disposed to rotate about the center of the silo and having a drive unit for rotating said sweep auger, an overload mecha-

nism connected in the drive unit and including a drive member, a drive pawl operably connected to the drive member and disposed to move in a reciprocating path, a rotatable ratchet having a series of teeth to be engaged by the drive pawl, said drive pawl acting to engage said teeth and incrementally rotate said ratchet in one direction, a holding pawl engaged with said teeth to prevent rotation of the ratchet in the opposite direction, a shaft operably connected to the ratchet and disposed to rotate with the ratchet, a sprocket connected to the inner end of the shaft and having a plurality of teeth, a turntable mounted for rotation with respect to the silo and located at the center of the silo, a plurality of spaced driving elements disposed on said turntable and engageable with the teeth of said sprocket for rotating said turntable in accordance with rotation of said sprocket, said sweep auger being mounted on said turntable and disposed to rotate therewith about the axis of said silo, and resilient means interconnecting the drive pawl and the drive member, whereby interruption of rotation of the sweep auger due to engagement of the sweep auger with a densely packed area of stored material will cause compression of said resilient means and enable said drive pawl to move in said reciprocating path without corresponding rotation of said ratchet, said overload mechanism having the capability of permitting the sweep auger to oscillate and back away in a reverse direction from said densely packed area.

4,437,807

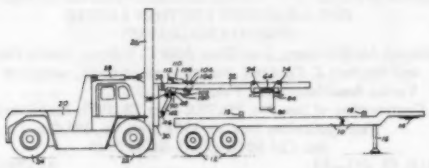
WHEELED TRAILER FRAME CARRYING UNIT ATTACHMENT FOR LIFT TRUCK

Lynn F. Perrott, Portland, Oreg., assignor to Scott S. Corbett, Jr., Portland, Oreg.

Continuation of Ser. No. 174,519, Aug. 1, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,504

Int. Cl.³ B66F 9/18

U.S. Cl. 414—620 **20 Claims**



1. A trailer frame carrying unit for carrying the empty elongated wheeled frame of a trailer of the detachable cqrgo container type having a wheel assembly mounted adjacent its rearmost end, the trailer frame carrying unit comprising, in combination with a powered vehicle mounting a vertically movable carriage:

(a) an elongated boom secured at one end to the carriage for pivotal movement between horizontally and vertically extending positions,

(b) power means engaging the boom for moving the latter between said positions, and

(c) trailer frame holding means mounted on the boom and arranged to releasably clamp a trailer frame thereto, to move the secured trailer frame vertically by moving the carriage vertically, and to move the trailer frame between horizontal and vertical positions by pivoting the boom between horizontally and vertically extending positions, the holding means including a base mounted on the boom and a pair of spaced apart frame-engaging clamp jaw members mounted on the base for movement one toward and away from the other to a clamping position closely adjacent each other for releasably clamping between them the thickness dimension of the frame of a trailer,

(d) said boom and trailer frame holding means configured and arranged to clamp the trailer frame forwardly of the wheel assembly for moving the clamped trailer frame selectively between its normal ground-supported horizontal position and a substantially vertical position with its forwardmost end extending upwardly and its rearmost, wheeled end elevated above ground for transport.

4,437,808

APPARATUS FOR CAUSING A UNIT GUIDED ON RECTILINEAR RAILS TO MOVE GRADUALLY AND A FORKLIFT EQUIPPED WITH SUCH A UNIT

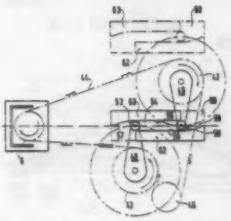
Rene Londos, and Jean-Luc Barbereau, both of Saint-Jean-de-Braye, France, assignors to Compagnie Generale de Manutention et de Stockage, Paris, France

Filed Apr. 12, 1982, Ser. No. 367,522

Claims priority, application France, Apr. 27, 1981, 81 08304

Int. Cl.³ B65G 1/06

U.S. Cl. 414—667 **7 Claims**



1. An apparatus for causing a load to be moved gradually in either of two directions between two end positions, said apparatus comprising: a load support, rectilinear rails for guiding said support for movement along said rails, said support having a rectilinear slot, said slot being elongated perpendicularly to the direction of movement of said support and being open at both its end, toothed wheels driven in opposite directions, mounted on either side of a a neutral central position of the slot, each wheel bearing an eccentric crankpin which engages in the slot to drive it while it runs through a half-circumference around the toothed wheel and said crankpins alternately engaging said slot so as to drive it alone while running through a half-circumference.

4,437,809

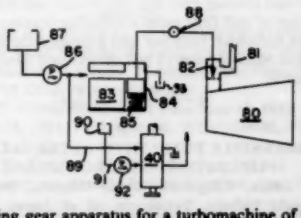
TURNING GEAR INTERLOCK

Norman E. Nutter, Lunenburg, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Dec. 31, 1981, Ser. No. 336,500

Int. Cl.³ F01D 15/12, 21/00

U.S. Cl. 415—41 **7 Claims**



1. A turning gear apparatus for a turbomachine of the type including a rotor and a motive fluid admission valve, said motive fluid admission valve mechanically connected to a hydraulic valve control manifold; the turning gear including a movable gear carriage for selectively engaging with and disengaging from a rotor ring gear wherein the turning gear further includes;

a turning gear interlock housing hydraulically connected to the valve control manifold; and,

a spool valve axially slidable within the interlock housing for selectively blocking and porting hydraulic fluid through said housing; the spool valve being connected to the turning gear carriage whereby in the engaged position the interlock housing is ported thereby preventing pressurization of the valve control manifold and in the disengaged position the interlock housing is blocked to permit pressurization of the valve control manifold.

4,437,810

COOLED VANE FOR A GAS TURBINE ENGINE

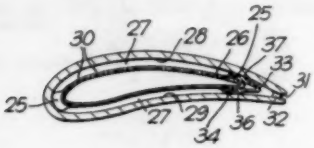
Eric W. J. Pearce, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 24, 1982, Ser. No. 351,616

Claims priority, application United Kingdom, Apr. 24, 1981, 8112806

Int. Cl.³ F01D 5/18

U.S. Cl. 415—115 **3 Claims**



1. A cooled vane for a gas turbine engine comprising a hollow aerofoil having a leading edge region and a trailing edge region, said aerofoil including convex and concave flanks having opposed faces defining a hollow interior, at least one cooling fluid entry tube extending spandwise of and located within said hollow interior of said aerofoil, said tube being spaced from the opposed faces of said convex and concave flanks to define a clearance therebetween, said tube having apertures for supplying a cooling fluid into said clearance to impinge upon and cool said opposed faces of said convex and concave flanks, an unrestricted aperture means in the trailing edge region of said aerofoil having communication with said clearance for discharging cooling fluid, and a flow metering insert extending spanwise of said aerofoil between opposed faces of said concave and convex flanks of said aerofoil adjacent the trailing edge region thereof for metering the cooling air from said clearance to said unrestricted aperture means, said flow metering insert having a hairpin-shaped cross section defined by a pair of limbs and into which a trailing edge of said tube projects to form a seal therewith, said limbs of said flow metering insert defining two accurately predetermined flow areas for cooling fluid leaving said clearance to be discharged through said unrestricted aperture means, a first one of said flow areas controlling leaving of said fluid from said clearance between said cooling tube and one of said opposed faces and a second one of said flow areas controlling leaving of said fluid from said clearance between said cooling tube and a second one of said opposed faces of said convex and concave flanks of said aerofoil.

4,437,811

SUBMERSIBLE PUMP WITH ALTERNATE PUMP OPERATION CONTROL MEANS

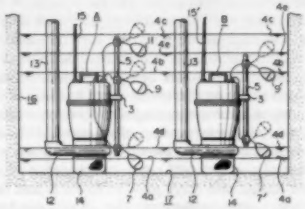
Minoru Iwata, Chigasaki; Yukio Murata, Fujisawa, and Tomoyuki Shibata, Yokohama, all of Japan, assignors to Ebara Corporation and Ebara Densan, Ltd., both of Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 163,948

Int. Cl.³ F04B 49/04

U.S. Cl. 417—8 **10 Claims**

1. A pump control system employing two pumps for pumping out the liquid in a reservoir or the like wherein the one pump includes first and second sensing means for providing first or high and second or low liquid level signals, respectively, and control circuit means responsive to said first and second sensing means for controlling the one pump to be alternately energized between said first and second liquid levels and wherein the other pump includes third and fourth sensing means for providing third or high and fourth or low liquid level signals, respectively, and control circuit means responsive to said third and fourth sensing means for controlling the other pump to be energized between said third and



fourth liquid levels; the improvement comprising that the control circuit means for the one pump includes step memory means having first and second states or positions, the state of said memory means being changed between the first and second states upon receipt of each of said first liquid level signals for conditioning the control circuit means to alternately initiate and inhibit the operation of the one pump upon receiving said first liquid level signal whereby said second liquid level may be positioned either higher or lower than said fourth liquid level.

4,437,812

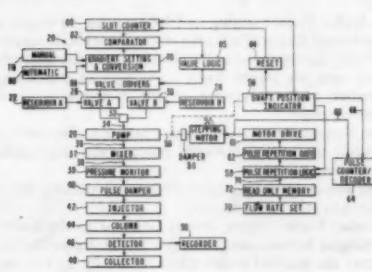
SINGLE-PUMP MULTIPLE STROKE PROPORTIONING FOR GRADIENT ELUTION LIQUID CHROMATOGRAPHY

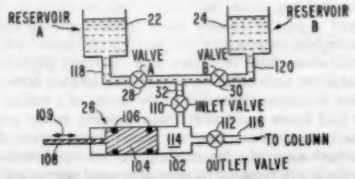
Ahmad Abu-Shumays, Los Altos; John C. Helmer, Menlo Park, and Stephen J. Luchetti, Berkeley, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 796,782, May 13, 1977, abandoned. This application Sep. 25, 1981, Ser. No. 305,426

Int. Cl.³ F04B 49/00; B67D 5/46

U.S. Cl. 417—53 **14 Claims**





1. In a high pressure, high performance liquid chromatogra-

phy system a method for providing gradient proportioning of a plurality of solvent components, said system comprising:

a plurality of solvent reservoirs, each of said reservoirs containing a particular one of said solvent components,

a single reciprocating pumping means,

proportioning valves for admitting said solvent components into said pumping means from said reservoirs during fill strokes of said pumping means according to a programmed concentration distribution that may vary for different fill strokes, and

a mixing structure into which said pumping means can deliver said plurality of solvent components, said gradient proportioning method comprising utilization of a pumping cycle that provides accurate proportioning near zero and one hunhundred percent concentration, said method includes a plurality of fill strokes, with a selected concentration distribution of more than one of said solvent components being permitted in said pumping means during less than all of the fill strokes of said pumping cycle and, during a said fill stroke in which a selected concentration is created, actuating the said proportioning valve for the higher concentration solvent prior to the activation of the said proportioning valve for the lower concentration solvent.

4,437,813

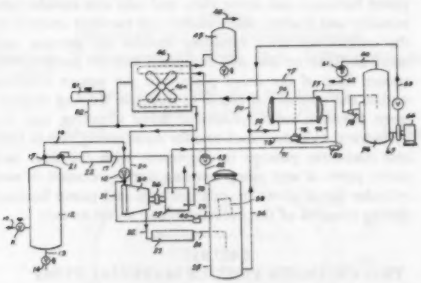
GAS RECEIVING AND TRANSMITTING SYSTEM

Walter B. Ingram, Hagerstown, Md., assignor to Frick Company, Waynesboro, Pa.

Filed May 4, 1982, Ser. No. 374,820

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—53 **17 Claims**



1. A system for receiving relatively high moisture content raw gas from a location and pumping it in a relatively dry condition to an outlet, comprising an oil injection type rotary compressor, an internal combustion engine connected to drive said compressor, first pipe means for carrying said raw gas to the inlet of said compressor, second pipe means for carrying raw gas to said engine, third pipe means for carrying oil to said compressor, fourth pipe means leading from said compressor to a separator housing, means in said fourth pipe means for intermingling the fluids discharged from said compressor, means in said separator housing for separating the gas from the oil and water mixture, means for discharging dry gas from the upper portion of said separator housing, discharge means from the lower portion of said housing for the mixture of oil and water, means for returning a predetermined major portion of said oil and water mixture to the third pipe means to said compressor, means for diverting the remainder of said oil and water mixture, heat exchange means between said means for diverting the remainder and said engine thereby raising the temperature of said diverted remainder of said oil and water mixture, a dehydrator housing, means carrying said diverted remainder to said dehydrator housing, pump means for drawing liquid from the lower portion of said dehydrator housing, means connected to the upper portion of said dehydrator housing for creating a vacuum therein whereby water vapor is removed from the oil and drawn off from said dehydrator housing, and means for returning the water-free oil from said pump means of said dehydrator housing to said third pipe means to said compressor.

4,437,814

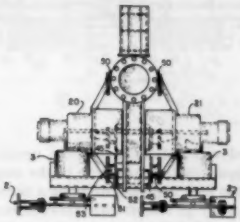
DREDGE PUMP DRIVE SYSTEM

John F. Kalbac, St. Louis, Mo., assignor to Delta Dredge and Pump Corporation, St. Louis, Mo.

Filed Jul. 15, 1981, Ser. No. 283,488

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—351 **4 Claims**



1. In a dredge pump having a pump housing and an impeller within said housing, the improvement comprising a shaft upon which said impeller is mounted, said shaft projecting through and beyond said housing on both sides of said impeller; two drive motors outside said housing, one rigidly coupled to one end of said shaft and the other, to the other end of said shaft, to drive said shaft, hence said impeller, and mounting means for mounting said drive motors, said mounting means comprising angularly spaced supports to which said drive motors are connected, pads, each including an elastomeric block bonded to and sandwiched between inner and outer flat plates, one of each of said plates being connected to one of said supports, the flat plates on the supports of each of the motors lying in substantially a common plane and the said plates on the supports of the two motors lying in substantially parallel planes, fixed structures on opposite sides of said pump housing, each having mounting flats spaced and arranged complementarily to pads on its respective side of the pump housing, the other of said plates of each pad being connected to a flat of one of said structures, the pad plates closest to the housing on opposite sides of the pump housing facing one another, whereby in response to axial movement of the impeller shaft, hence the motors, one set of pads is in compression, the other, in tension and in response to turning moment of said motors, both sets are in shear.

4,437,815

PUMP, AND AN APPARATUS INCORPORATING THE PUMP FOR INFUSING LIQUID MEDICINE

John K. McMullen, "Carragh" 11 Mount Aboo Park, Finahgy, Belfast BT10 ODJ, Northern Ireland

PCT No. PCT/GB80/00150, § 371 Date May 15, 1981, § 102(e) Date May 15, 1981, PCT Pub. No. WO81/00888, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 29, 1980, Ser. No. 269,042

Claims priority, application United Kingdom, Sep. 27, 1979, 7933486

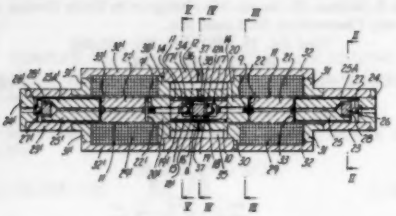
Int. Cl.³ F04B *17/04*

U.S. Cl. 417—418 **6 Claims**

1. A pump comprising a casing defining an elongate chamber, inlet and outlet valves communicating with the chamber, a piston coaxially movable in the chamber, and an electromagnet controlling movement of the piston via an armature, the outlet valve also being controlled by the electromagnet via a valve armature;

characterised in that the inlet and outlet valves are balls

made from a material having ferromagnetic properties and seats made of non-magnetic material and magnets tensioning the balls of said inlet and outlet valves against their seats when in a closed position, and in that power means for opening said balls from their seats, comprise for said inlet valve a force equivalent to a hydraulic force caused by coaxial movement of the piston in the chamber, said



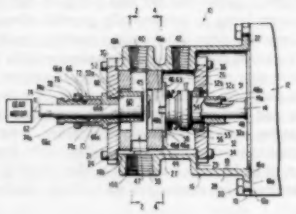
piston and said outlet valve being operated against the flow of liquid by the excitation of the single electromagnet, a piston lock magnet providing a biasing force on the piston thereby to inhibit unintentional movement of the piston, and said outlet valve remaining closed in response to adverse inlet or outlet pressure conditions to prevent inadvertent flow of liquid.

4,437,816

VARIABLE VOLUME POSITIVE DISPLACEMENT ROTARY PUMP

Dennis A. Magee, Marshalltown, and Charles E. McCubbin, Melbourne, both of Iowa, assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Mar. 21, 1980, Ser. No. 132,712
Int. Cl.³ F04B *19/02*
U.S. Cl. 417—465 **4 Claims**



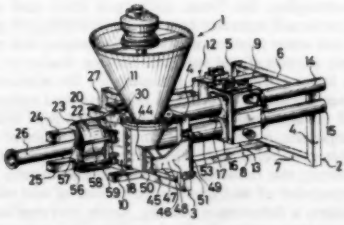
1. An improved variable volume rotary pump comprising:
a pump housing having a cylindrical bore,
a cylinder block having a diameter on the order of said pump housing bore and being mounted concentrically within said bore for rotation about its axis,
circumferentially spaced inlet and outlet ports within said housing opening radially to said bore,
said cylinder block being provided with an axial opening,
at least one diametric passage of rectangular cross-section extending through said cylinder block,
a piston member of corresponding rectangular transverse cross-section slidably and sealably positioned within said diametric passage and having a cross-section corresponding to but being slightly smaller than that of said diametric passage, said piston member bearing a square slot within a side face thereof intermediate of its ends and facing axially towards one end of said cylinder block and forming two connected rectangular cross-section pistons on respective sides of said rectangular slot,
a square drive block carried within said piston member slot,
means for mounting said square drive block within said cylinder block for rotation eccentrically relative to the axis of said drive block,
motor means for driving said cylinder block about its axis of rotation, and
annular grooves carried by said pump housing within said cylindrical bore opening respectively to said inlet and said outlet port but being separated from each other by lands such that said at least one diametric passage of said cylinder block opens alternately to said grooves during continuous rotation of said cylinder block;
whereby, said rectangular cross-section pistons reciprocate within said cylinder block at least one diametric passage to pump fluid from said inlet port to said outlet port with said assembly preventing piston rotation and contact between pistons, with increased contact area between said pistons and said drive block to reduce wear, noise and fatigue of said pistons,
and wherein said motor drive shaft bears a cylindrical drive coupling rotatable therewith, said drive coupling terminating at the end remote from said electric drive motor in a rectangular cross-section axial projection, and a drive plate comprising a rectangular cross-section slot on the side opposite that bearing the square projection received within the axial opening of square transverse cross-section of said cylindrical block, and said pump further comprising transverse end plates for closing off said pump housing cylindrical bore, one annular seal member carried by said cylindrical drive coupling on the outer periphery thereof and bearing at one end on a second annular seal member mounted to the end plate through which said drive motor shaft projects, and a compression coil spring concentrically surrounding the cylindrical drive coupling and interposed between said drive plate and said one annular seal member and biasing said annular seal member carried by the cylindrical drive coupling against the annular seal member fixed to said one end plate and for pressing the square face of the drive plate into the square opening within the cylindrical block to maintain driving engagement between said cylindrical drive coupling and the cylindrical cylinder block and for maintaining said at least one diametric passage in alignment with the inlet and outlet ports of said pump housing during rotation of said cylinder block about its axis towards said pump housing during rotation of the cylinder block about its axis.

4,437,817

TWO CYLINDER VISCOUS MATERIAL PUMP

Wolfgang Metzelder, Ibbenbüren, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Continuation of Ser. No. 205,296, Nov. 10, 1980, abandoned. This application Jul. 20, 1983, Ser. No. 515,450
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024139
Int. Cl.³ F04B *39/08*
U.S. Cl. 417—507 **6 Claims**



1. A viscous material pump comprising:
a pair of conveying cylinders (16, 17), one of said conveying

cylinders being arranged above the other in a common plane with axes of the cylinders, along which the material is conveyed, being horizontal and lying parallel to each other;

an inlet valve housing (**18**) connected to said conveying cylinders;

a viscous material supply source (**41**) mounted on a side of said inlet valve housing laterally of the common plane of said conveying cylinders;

an outlet valve housing (**23**) connected intermediate said inlet valve housing (**18**) and a delivery conduit (**26**) for conveying the viscous material and extending horizontally from said outlet valve housing;

a pair of inlet valve means (**27**, **27***a*) mounted on said inlet valve housing for controlling the passage of the viscous material from said supply source (**41**) to said conveying cylinders (**16**, **17**), said inlet valve means extending horizontally from a side of said inlet valve housing opposite that on which said viscous material supply source is mounted and extending normal to the conveying axes of the cylinders, one of said inlet valve means being arranged above the other on said inlet valve housing in a common plane; and

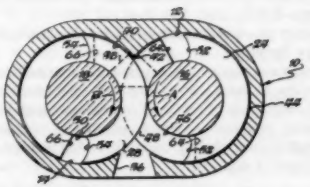
a pair of outlet valve means (**24**, **25**) mounted on said outlet valve housing (**23**) adjacent said delivery conduit for controlling the passage of viscous material to said delivery conduit (**26**), said outlet valve means (**24**, **25**) extending horizontally from said outlet valve housing parallel to said conveying axes, one of said outlet valve means being arranged above the other in a common plane with said delivery conduit extending between said pair of outlet valve means.

4,437,818

OIL-FREE ROTARY COMPRESSOR

Roger C. Weatherston, 58 Bridle Path, Williamsville, N.Y. 14221

Filed Dec. 2, 1981, Ser. No. 326,766
Int. Cl.³ F01C *1/08*; F04C *18/00*
U.S. Cl. 418—9 **9 Claims**



1. A rotary compressor comprising:

a housing defining two working chambers;

mating impellers rotatably mounted in each working chamber;

each impeller having at least two profiles;

each profile containing only one lobe and only one well, the well volume in any one profile in fluid communication with the well volume in any other profile of each impeller;

each of said lobes occupying a constant axial position;

inlet port means in direct fluid communication with all of said profiles;

outlet port means for cyclically and alternately coacting with each of said working chambers to deliver a continuous gas discharge; and

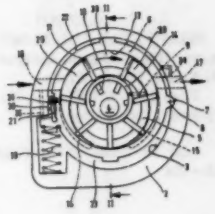
the arcuate extent of each profile and the angular displacement between adjacent profiles on the same impeller being such that as a leading well volume in one of said profiles begins to engage with the lobe of its mating profile to start precompression of the gas therein at inlet pressure, the trailing well volume in the profile adjacent said first profile is still in communication with said inlet port means, whereby the pressure of the gas in said leading well volume is increased above that in said trailing well volume until the trailing well volume is blocked from communication with said inlet port means.

4,437,819

CONTROLLABLE VANE PUMP

Johann Merz, Bopfingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,935
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122598
Int. Cl.³ F04C *2/00*, *15/04*
U.S. Cl. 418—26 **6 Claims**



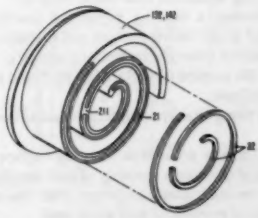
1. In an adjustable vane cell pump having a rotor, a plurality of radially displaceable vanes slidably mounted on the rotor, a control ring in sliding contact with the vanes enclosing fluid displacing spaces therebetween, means biasing the vanes into said sliding contact with the control ring, a housing formed with an internal surface and means pivotally supporting the control ring in the housing exclusively at a pivot point for angular adjustment to vary flow rate, the improvement residing in sealing means including an arcuate sealing portion (**30**) of the internal surface concentric with the rotor (**5**) mounted radially opposite the pivot point, a sealing element (**21**, **32**) having opposite ends, and means pivotally mounting one of said ends of the sealing element on the control ring (**6**), the other of the ends of the sealing element being held in contact with the sealing portion on the housing (**2**).

4,437,820

SCROLL TYPE FLUID COMPRESSOR UNIT WITH AXIAL END SURFACE SEALING MEANS

Kiyoshi Terauchi, Isesaki, and Masaharu Hiraga, Honjyo, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Sep. 30, 1981, Ser. No. 307,291
Claims priority, application Japan, Sep. 30, 1980, 55-140393[U]; Sep. 30, 1980, 55-140394[U]
Int. Cl.³ F04C *18/02*, *27/00*; F16J *15/16*
U.S. Cl. 418—55 **7 Claims**



1. In a scroll type fluid compressor including a pair of scroll members each comprising an end plate and a spiral wrap extending from one side of said end plate, said spiral wrap having a groove formed in the axial end surface thereof along the

spiral curve, said spiral wraps interfitting at an angular and radial offset to make a plurality of line contacts which define at least one pair of fluid pockets, drive means operatively connected to one of said scroll members for orbiting said one scroll member relative to the other scroll member and preventing rotation of said one scroll member to change the volume of the fluid pockets, the improvement comprising:

at least one closed portion intermediate the ends of said groove to divide said groove into at least two separate grooves to block fluid flow in said groove; and

seal elements loosely fitted within said grooves on both sides of said closed portion, said closed portion preventing deformation and bending of said seal elements.

4,437,821

SHAFT SEAL FOR PUMP MEANS

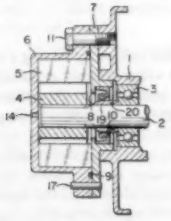
Hitoshi Ogawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1981, Ser. No. 284,538

Claims priority, application Japan, Jul. 23, 1980, 55-104401[U]

Int. Cl.³ F04C *15/00*; F16J *15/32*

U.S. Cl. 418—104 **3 Claims**



1. A pump means comprising:

a cylindrical housing means having a hollow interior open at one end thereof and having an inlet port and an outlet port in the cylindrical wall of said housing;

an annular disc over the open end of said housing means for closing said hollow interior so as to form a working chamber;

a rotor means rotatably mounted within said working chamber with the axis of rotation eccentric to the axis of said working chamber;

vane means radially shiftably mounted on said rotor means and having out edge portions constantly slidably abutting the inner peripheral surface of said housing means for urging fluid from said inlet port to said outlet port;

frame means to which said housing means and said annular disc are fixed;

shaft bearing means on said frame means;

a shaft having a bearing supported portion and rotatably mounted in said bearing means and extending into said working chamber through the center opening of said annular disc means, the portion of said shaft within said working chamber being splined;

said rotor being fixedly mounted on said splined portion of said shaft;

an oil seal means secured at its outer surface of the inner periphery of the center opening of said annular disc means and having an inner diameter larger than the outer diameter of the splined portion of said shaft; and

a spacer means tightly fitted on said shaft with the outer periphery sealingly engaging said oil seal means for hermetically sealing said working chamber, said spacer means extending along the length of said shaft only from said splined portion to said bearing supported portion.

4,437,822

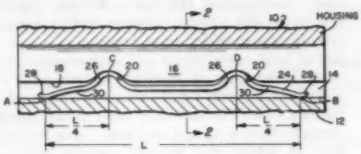
RADIAL SEALING MEANS FOR USE WITH, AND IN COMBINATION WITH, A SLOTTED ROTOR

Jeremy Schwartz, Somerset, and Raymond Frick, West Windsor Township, Mercer County, both of N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 23, 1981, Ser. No. 333,996

Int. Cl.³ F01C *19/02*; F04C *27/00*

U.S. Cl. 418—122 **49 Claims**



1. For use with a rotor having a substantially radial slot formed therein, which slot extends axially of the rotor, radial sealing means, for insertion in said slot for effecting fluid sealing externally of said rotor, comprising:

first means comprising an elongate element, such as a seal, a vane, or the like, for slidable disposition and radial movement, of at least a portion thereof, within said rotor slot; and

second means, for interpositioning thereof between said first means and said slot, for biasing said first means outwardly relative to said slot; wherein

said first and second means have keying means cooperative for constraining said first and second means against a relative longitudinal or axial movement therebetween in either of opposite longitudinal or axial directions;

said second means comprises a leaf spring of a given length; and

said elongate element has an inner surface, of approximately said given length, for confrontingly engaging said leaf spring;

one of said first and second means has means defining keyways therein; and

the other of said first and second means has means defining keys thereon;

said keys and keyways being defined intermediate said given lengths of said leaf spring and said inner surface, and defining a pair of points of mutual contacting engagement which maintain a given, unaltering, radial alignment therebetween during slidably radial movement of said element in said slot.

4,437,823

ROTARY MACHINE WITH AN AXIALLY MOVING PARTITION

Rein K. Tigane, Tallin, U.S.S.R., assignor to Upravlenie Sanitarno-Tekhnicheskikh Rabot, Tallin, U.S.S.R.

PCT No. PCT/SU80/00040, § 371 Date Nov. 10, 1980, § 102(e) Date Nov. 10, 1980, PCT Pub. No. WO80/01934, PCT Pub. Date Sep. 18, 1980

PCT Filed Feb. 29, 1980, Ser. No. 217,111

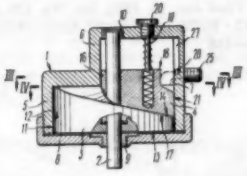
Claims priority, application U.S.S.R., Mar. 13, 1979, 2729663; Mar. 13, 1979, 2729664

Int. Cl.³ F01C *1/00*; F04C *18/00*

U.S. Cl. 418—219 **7 Claims**

1. A rotary machine construction for use in pumps, compressors and motors, comprising a stator defining a housing having a cylindrical working chamber therein, a rotor rotational in said chamber, a shaft fixed to the rotor and having one end extending externally of the housing, said rotor comprising a disk driven rotationally, said disk having peripheral, circumferentially disposed surfaces in sliding contact with interior surfaces of said housing defining said chamber, the disk having a major side having a flat surface and an opposite major side

having an eccentric flat surface extending radially inwardly from a peripheral edge of the disk and having two symmetrical surfaces as continuations of the eccentric flat surface extending away from said eccentric flat surface, the two symmetrical surfaces defining two portions on said opposite major side merging smoothly with the eccentric flat surface and extending progressively axially away from the eccentric flat surface to the edge of the disk at part of the edge of the periphery thereof, said two symmetrical portions thereby having a thickness progressively reducing axially toward said part of the edge of the periphery of the disk, a radial partition mounted for movement axially of said shaft and disposed relative to said opposite major side of the disk dividing the working chamber into two separate chamber working spaces continuously varying in volume as the disk is rotated, means resiliently continuously biasing the partition into contact with said opposite major side of said disk radially of said eccentric flat surface, said two symmetrical surfaces configured for each effectively camming the partition each through 180° and reciprocably actuating the partition as the disk is rotationally driven and the partition functions as a cam follower, and means on said housing defining two circumferentially spaced ports each in com-



munication with a corresponding one of said chamber working space for functioning alternatively as an inlet or outlet in dependence upon the direction of rotation of the disk, said housing having two opposed flat walls defining said chamber, one of said walls having a slot in which said partition reciprocates internally of the housing, said housing defining a second chamber defined by said one flat wall and another flat wall of the housing and disposed axially spaced from said partition, a second disk in said second chamber fixed to said shaft constructed similar to the first-mentioned disk and disposed on said shaft rotated 180° relative to the first-mentioned disk and having symmetrical surfaces of the first-mentioned disk with said one wall therebetween and the disk portions of reducing thickness being rotated 180° relative to each other, said partition being disposed extending through said slot into said chamber to define therein two separate working spaces in conjunction with said symmetrical surfaces of the second disk, said partition having edge face surfaces in sliding contact with corresponding symmetrical surfaces of the individual disks and reciprocably actuated by each disk in a respective corresponding opposite direction of reciprocation as the disks are rotated, and means mounting the second disk for rotation with said shaft and free to move axially on said shaft.

4,437,824

APPARATUS FOR MAKING PARTICLEBOARD BY A CONTINUOUS EXTRUDING TECHNIQUE OF PARTICULATED MATERIALS

Jozsef Palotai, Budapest, Hungary, assignor to Chemokomplex Vegyipari Gepes Berendezes Export-Import Vallalat, Budapest, Hungary

Filed May 4, 1981, Ser. No. 259,819
Int. Cl.³ B29J *5/00*
U.S. Cl. 425—131.1 **5 Claims**

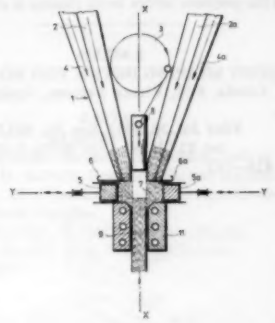
1. Apparatus for the continuous manufacturing of a pressed multilayer product from particulated materials, comprising:

a multicompartmented hopper means for receiving said particulated materials, each compartment is adapted to be charged with a different material and having an input and an output end portions;

a pressing chamber located at the output end portions of said compartments;

a forward pressing piston means mounted for sliding into and out of said pressing chamber for compacting said particulated materials during such forward motion;

a pair of side pressing piston means having pressing surfaces and mounted for moving into and out of said pressing chamber from opposing directions, said opposing directions being perpendicular to the direction of motion of



said forward pressing piston means wherein said side pressing piston means compact said particulated materials from said opposing directions;

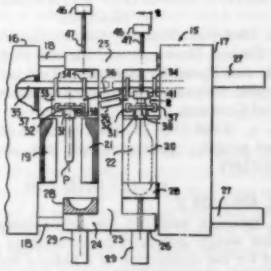
an output canal means for receiving said compacted material and feeding same away from the region of said pressing chamber upon the action of said forward pressing piston means and of said pair of side pressing piston means, wherein said hopper means comprises at least a pair of compartments located on each side of said forward pressing piston means, and wherein heating means are provided along said output canal means.

4,437,825

BLOW MOLDING APPARATUS

Ieuan L. Harry; Suppayan M. Krishnakumar, both of Nashua; Walter R. Jolly, Merrimack; Martin H. Beck, Brookline, all of N.H., and John F. E. Pocock, Gravenbruch, Fed. Rep. of Germany, assignors to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 321,152, Nov. 13, 1981, Pat. No. 4,409,161.
This application Sep. 30, 1982, Ser. No. 432,039
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—145 **7 Claims**



1. A blow molding apparatus comprising a blow mold including blow mold halves, means for moving said blow mold halves between a closed blow molding position and an open

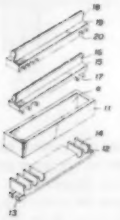
combined blown article discharge and preform receiving position, a stretch rod and a blow head in constant alignment with one of said mold halves, means movable laterally relative to said one mold half for effecting discharge of a blown article from between said blow mold halves and the positioning of a preform between said blow mold halves in transverse alignment therewith, sensor means for sensing when a preform is in transverse alignment with said blow mold halves, means actuated by said sensor means for transversely shifting the preform into a seated position within said one blow mold half, and means for advancing said stretch rod into the preform seated within said one blow mold half and the blow head to a position adjacent the preform before mold closing is completed.

4,437,826

RICE-BODY SHAPING DEVICE FOR ROLLED SUSHI

Akitomi Tezuka, 5-11, Kinuta 3-chome, Setagaya-Ku, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,532
Int. Cl.³ B29C *1/00*; B29D *3/00*
U.S. Cl. 425—182 **2 Claims**



1. A rice-body shaping device for a rolled sushi comprising a hollow square frame, a base having a width insertable into the hollow frame which is fixedly provided with a stopper member of a size larger than the said width on the lower side thereof and is provided on the upper side thereof with plural semi-cylindrical notches in parallel arrangement, a ram member having a width insertable into the said hollow member and plural projections provided on the lower side thereof which are arranged at such intervals that, when inserted into the frame, the projections are made to come at the center of the respective semi-cylindrical notches provided on the said base, and a push cover of a width insertable into the said hollow member which is provided on the lower side thereof with notches symmetrical to the said semi-cylindrical notches of the said base.

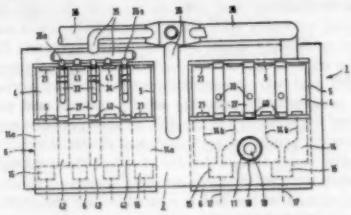
4,437,827

SPINNING MANIFOLD WITH SERIAL NOZZLE BLOCKS

Helmut Moderlak, Maintal; Günter Koschinek, Dietzenbach; Rolf Zinsser, Heusenstamm; Richard Prehler, Frankfurt am Main, and Bernd Kretschmann, Kahl, all of Fed. Rep. of Germany, assignors to Davy McKee Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,249
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113495
Int. Cl.³ D01D *1/06*
U.S. Cl. 425—378 S **7 Claims**

1. A spinning manifold for melt-spinning synthetic high molecular weight polymers comprising, an elongated hollow member for the conduction of a heating medium and at least one vertical nozzle shaft having heatable walls, said nozzle shaft having a plurality of serially arranged separately dismountable nozzle blocks and at least one separately dismountable heatable member, said at least one heatable member extending the width of said nozzle shaft, said at least one heatable member and said nozzle blocks being arranged in an alternating configuration with respect to each other such that at least one of said at least one heatable member is located between and



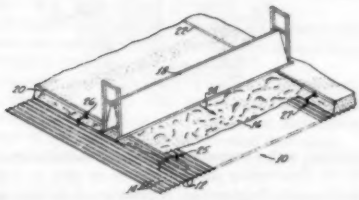
in heat exchange with each juxtaposed pair of said nozzle blocks.

4,437,828

SCREED BAR ASSEMBLY

David L. Egger, 1270 Lynwood St., LaHabra, Calif. 90631

Filed Jan. 15, 1982, Ser. No. 339,190
Int. Cl.³ B28B *1/29, 21/92*; E01C *19/00, 19/22*
U.S. Cl. 425—458 **16 Claims**



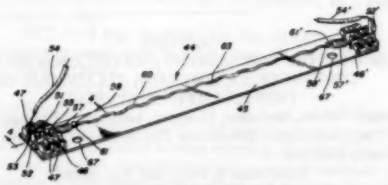
1. A screed support assembly comprising
a screed bar support,
a screed bar mounted in said support for vertical adjustment,
first and second support legs positioned outwardly of said support, and
means for mounting at least one of said legs to said support for motion relative to said screed bar, whereby the position of said one leg relative to the other of said legs and relative to the screed bar may be adjusted.

4,437,829

ROLL-OUT FLAME DETECTOR FOR SWIMMING POOL HEATER FUEL GAS CONTROL

Marvin E. Baker, 815 Ewing Ave., Nashville, Tenn. 37203

Filed Oct. 19, 1981, Ser. No. 312,403
Int. Cl.³ F23N *5/02*
U.S. Cl. 431—21 **6 Claims**



1. In a swimming pool heater having a combustion chamber and a control chamber separated by a fire wall having a lower edge, burner tubes extending from the control chamber into the combustion chamber beneath the lower edge, a fluid fuel supply, a control valve connected in fluid communication

between the fuel supply and the burner tubes and adapted to be opened and closed to the flow of fluid fuel to the burner tubes, and an electrical control circuit operably connected to the control valve for opening and closing the control valve, a flame detector device, comprising:

(a) a base,

(b) a pair of electrical contacts,

(c) insulated mounting means supporting said electrical contacts at longitudinally spaced positions on said base,

(d) an elongated thermal fuse element having opposite ends and adapted to melt at a predetermined termperature substantially less than the temperature of the flame produced by the burner tubes,

(e) suspension means holding the opposite ends of said fuse element between, and in electrical communication with, said pair of electrical contacts and spaced from said base,

(f) an inextensible linear member extending along said fuse element and having opposite ends connected to said suspension means to prevent stretching of said fuse element,

(g) means mounting said base on the fire wall within the control chamber so that said fuse element extends substantially along and proximate to the lower edge of the fire wall, for sensing any roll-out flame from the combustion chamber beneath the fire wall into the control chamber, and

(h) means connecting said electrical contacts in said electrical control circuit so that the control valve functions normally while said fuse element is unbroken, but said control valve is closed when said fuse element ruptures.

4,437,830

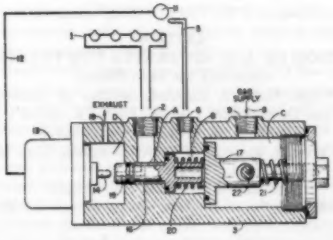
BURNER AND PILOT VALVE SAFETY CONTROL SYSTEM

Lewis K. Harris, and Billie S. Burrus, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 19, 1982, Ser. No. 399,558

Int. Cl.³ F23Q *9/08*

U.S. Cl. 431—54 **5 Claims**



1. A system for controlling the fuel to a burner and its pilot, including,

a supply of fluid fuel,

a main burner adapted to be connected to the supply of fuel,

a pilot burner adapted to be connected to the supply of fuel,

a housing containing a first chamber adapted to be connected to the main burner,

a second chamber in the housing connected to the pilot burner and the first chamber through a valve,

a third chamber in the housing connected to the fuel supply and the second chamber through a valve,

a first valve element normally closed by being spring-urged to seal between the first and second chambers,

a second valve element normally closed by being spring-urged to seal between the second and third chambers and arranged to be unseated by engagement with the first valve element,

a closed fluid pressure system arranged to respond to combustion at the pilot burner and to generate movement of an included piston element within the housing,

means for temporarily and manually unseating the second valve element to permit flow of fuel from the supply through the third chamber and into the second chamber and to the pilot burner where its combustion generates the heat which develops the force in the closed system and the mechanical movement of the piston within the housing,

and an arrangement within the housing for the piston of the closed fluid pressure system to engage the movable valve elements and overcome their spring forces to maintain the elements unseated and release the manual control which had temporarily unseated the second valve element.

4,437,831

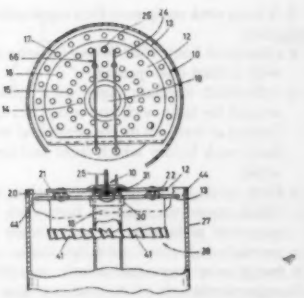
BURNER HEAD

Michael F. C. Brooker; Steven J. McKerihen, both of Toronto; Hashmukrai D. Attwala, Scarborough, and Antonio L. Cautillo, Toronto, all of Canada, assignors to Aero Environmental Limited, Toronto, Canada

Filed Oct. 27, 1980, Ser. No. 201,346

Int. Cl.³ F23C *5/08*; B05B *3/00*

U.S. Cl. 431—177 **2 Claims**

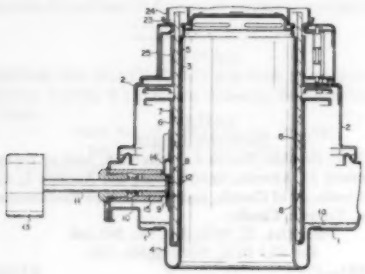


1. A flame spreading gas burner comprising in combination; a gas delivery tube, a gas delivering nozzle adjacent the end of said tube, an air passing inner nozzle plate, an air passing outer flame spreading plate, a turbulator, and an air delivery duct surrounding the foregoing parts, said nozzle plate surrounding said tube adjacent to and upstream of said nozzle, said flame spreading plate closing the end of said tube, said nozzle plate and said flame spreading plate being spaced and at right angles to the cylinder-axis of said tube, said nozzle being that part of the tube between the plates is circumferentially perforate between said nozzle plate and said flame spreading plate, said air delivery duct having an air discharge opening circumference greater than that of said nozzle plate and said spreading plate to provide relatively narrow circumscribing air passage therebetween; said turbulator being in the form of a set of radially disposed and uniformly skewed vanes surrounding said gas delivery tube spaced upstream from said nozzle plate and said spreading plate; the end of said gas delivery tube lying approximately in the centre of said nozzle plate and said spreading plate, said plates being closely adjacent; the area of said air discharge opening and the area of said nozzle plate and of said spreading plate are each at least predominately circular, said spreading plate being of a greater diameter than said nozzle plate, said greater diameter being occupied by a ring of air apertures, said nozzle and spreading plates being spaced apart a distance only approximately equal to that of the perforations in said tube.

4,437,832
LAMP WICK EQUIPMENT FOR A COMBUSTION APPARATUS

Kazunori Amano, Niitsu, and Youichi Sekiwaga, Kamo, both of Japan, assignors to Toshiba Heating Appliances Co., Ltd., Kamo, Japan

Filed Sep. 23, 1982, Ser. No. 422,197
Claims priority, application Japan, Oct. 15, 1981, 56-153261[U]
Int. Cl.³ F23D *8/24*
U.S. Cl. 431—304 **8 Claims**

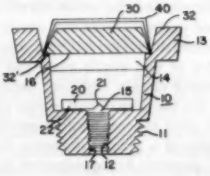


1. A lamp wick equipment for a combustion apparatus which comprises:
- a cylindrical lamp wick whose peripheral wall is provided with at least one opening;
- a cylindrical auxiliary lamp wick holder which is fitted around the lamp wick and comprises an engagement hole formed at that spot on the peripheral wall of said auxiliary lamp wick holder which faces said opening of the lamp wick;
- a lamp wick holder which comprises a cylindrical body fitted around the auxiliary lamp wick holder, and an engagement pawl which is so elastically supported as to be normally advanced into the inside of said cylindrical body, to be retractable therefrom, and to project into the engagement hole of the auxiliary lamp wick holder fitted into said cylindrical body to effect engagement between the lamp wick and lamp wick holder; and
- a lamp wick-removing device comprising at least one leg member which is inserted between the auxiliary lamp wick holder and the lamp wick holder to retract the engagement pawl from the engagement hole, thereby disengaging the lamp wick from the lamp wick holder.

4,437,833
INFRARED RADIATING BURNER ARTICLE

Frank D. Mertz, Bergenfield, N.J., assignor to Red-Ray Manufacturing Company, Inc., Cliffside Park, N.J.

Filed Mar. 5, 1981, Ser. No. 233,851
Int. Cl.³ F23D *13/14*
U.S. Cl. 431—329 **7 Claims**

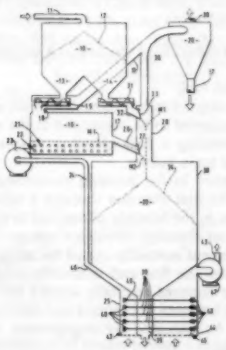


1. An infrared radiating burner article for generating infrared radiation, connectable to means for mixing air and gas and supplying such air/gas mixture thereof, comprising:
- (a) a housing, having a restricted inlet opening in communication with an enlarged opening extending therethrough, through which the air/gas mixture may be fired;
- (b) means for diffusing the air/gas mixture upon firing thereof through the housing opening so as to generate substantial pressure in such air/gas mixture, secured in the housing opening in the path of movement of the air/gas mixture upon firing thereof through the housing opening, said diffuser means including a plate confronting said inlet opening to form a slit orifice along the sides thereof;
- (c) a refractory grid, positioned in the housing opening in the path of movement of the air/gas mixture therethrough upon firing thereof through the housing opening, at a point beyond the location of the diffusing means in such path, such that the air/gas mixture is fired through the refractory grid, which refractory grid includes a surface thereof facing outwardly from the housing;
- (d) means for igniting the air/gas mixture, upon firing thereof through the refractory grid, at the outwardly facing surface of the refractory grid such that the flame heats the outwardly facing surface of the refractory grid so as to generate infrared radiation thereby;
- (e) means for reverberating infrared radiation generated by the refractory grid, secured to the housing so as to be spaced from the outwardly facing surface of the refractory grid in the path of infrared generated thereby, said reverberating means being a screen lying in a spaced relationship to said refractory grid;
- (f) means for enabling the article to be detachably connected to the means for mixing and supplying the air/gas mixture, said means for detachably connecting said article including external threads mounted on restricted portion of said housing, said restricted portion having a restricted opening directing said air/gas mixture to said diffusing means for delivery to said opening; and
- (g) said housing having tapered walls, adjacent said slit orifice between said orifice and said refractory grid.

4,437,834
METHOD OF AND APPARATUS FOR TREATING GRANULAR MATERIAL

Alfredo Vogel, Malvern, England, assignor to Cosworth Research and Development Limited, United Kingdom

Filed Dec. 15, 1981, Ser. No. 330,864
Claims priority, application United Kingdom, Dec. 16, 1980, 8040281; Nov. 23, 1981, 8135225
Int. Cl.³ F27B *15/00, 15/18, 5/02*
U.S. Cl. 432—14 **25 Claims**



1. A method of reclaiming used foundry sand containing an organic binder comprising the steps of separating a mass of said

sand from castings, placing the mass of sand in a stationary container and providing a supply of combustion supporting gas to the container wherein to reclaim the sand the mass of sand is maintained without agitation in the container whilst permitting the gas to percolate through the sand and whilst the sand is held in a treatment temperature range of 250° C. to below 400° C.

4,437,835

METHOD OF AND APPARATUS FOR MEASURING THE RATE AT WHICH GASES ARE BLOWN INTO A ROTARY KILN

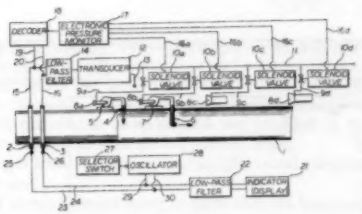
Clovis L. Martin, Sao Jeronimo, Brazil, assignor to Acos Finos Piratini S.A., Porto Alegre, Brazil and Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 398,800

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128556

Int. Cl.³ F27B 7/00

U.S. Cl. 432—103 **12 Claims**



1. A method of measuring the rate at which gases are blown in streams into a rotary kiln, said method comprising the steps of:

(a) introducing said gases into said kiln in respective streams;

(b) intercepting each of said streams with a constriction before the stream enters said kiln;

(c) pneumatically tapping each stream behind the respective constriction to generate a differential pressure between the pressure of each stream upstream of the respective constriction and a static second gas pressure, said differential pressures representing the flow rate of the respective streams into said kiln;

(d) transducing each differential pressure into respective electrical signals on said rotary kiln whereby each signal represents the flow rate of the respective stream; and

(e) tapping said electrical signals from said rotary kiln by slip rings on said kiln and stationary taps engaging said slip rings.

5. An apparatus for measuring the rate at which gases are blown in streams into a rotary kiln, said apparatus comprising:

means for introducing said gases into said rotary kiln in respective streams and including ducts traversed by the respective streams;

respective constrictions in said ducts traversed by said streams;

respective means connected to each duct upstream of the respective constrictions for detecting respective differential pressures between the pressure of each stream upstream of the respective constriction and a static second gas pressure, said differential pressures representing the flow rate of gases in the respective streams;

transducer means on said rotary kiln responsive to said differential pressures for transducing the respective differential pressures into respective electrical signals representing the flow rate of the respective streams;

slip rings on said rotary kiln receiving said electrical signals; and

stationary taps engaging said slip rings for tapping said electrical signals from said rotary kiln.

4,437,836

PHOTOPOLYMERIZABLE DENTAL COMPOSITIONS

Robert Schmitz-Josten, Cologne; Carlhans Süling, Odenthal; Wolfgang Podszun, Cologne; Bruno Bömer, Leverkusen; Manfred Borgardt, Wuppertal, and Michael Walkowiak, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,643

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3135113

Int. Cl.³ C08F 2/50

U.S. Cl. 433—199 **13 Claims**

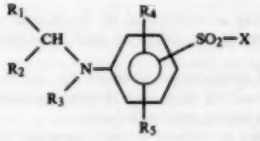
13. In the formation of a dental prosthesis, filling or coating comprising forming a composition comprising

(a) at least one ethylenically unsaturated photopolymerizable monomer,

(b) at least one photoinitiator selected from the organic mono- or di-carbonyl compounds and

(c) a photoactivator,

shaping said composition and then polymerizing said composition under the influence of light, the improvement which comprises employing as said photoactivator at least one alkylaminoarylsulphonyl compound of the formula



in which

R_1 and R_2 each independently is a hydrogen atom or an alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, aralkyl or alkaryl group which has 1 to 11 carbon atoms and is optionally substituted by at least one hydroxyl, amino, epoxy, urethane, urea, ester or ether group, or R_1 and R_2 together from a 3- to 6-membered ring, which optionally contains nitrogen, oxygen or sulphur as a hetero-atom,

R_3 independently of R_1, has any of the meanings given for R_1 or is a group of the formula

R_4 and R_5 each independently is a hydrogen atom, an alkyl or alkenyl group which has 1 to 10 carbon atoms and is optionally substituted by halogen, or a halogen atom, or

R_4 and R_5 are in ortho-positions relative to one another and, together with the aromatic nucleus, form a 4- to 8-membered ring, and

X is an alkyl or alkenyl group which has 1 to 10 carbon atoms and is optionally substituted by a hydroxyl, amino, urethane, urea or ester group, or is a group of the formula

wherein

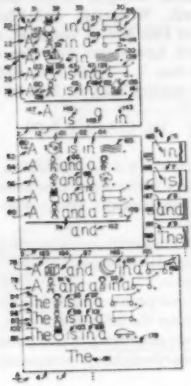
R_6 and R_7, independently of R_1 and R_2, have any of the meanings given above for R_1 and R_2.

4,437,837

EDUCATIONAL AID AND METHOD OF USING SAME

Shirley I. Schnettler, 5311 W. Berteau, Chicago, Ill. 60641, and Elinor Gilloon, 77 N. Michigan Ave., Chicago, Ill. 60611

Filed Dec. 11, 1981, Ser. No. 329,728
Int. Cl.³ G09B *17/00*
U.S. Cl. 434—178 **8 Claims**



1. A method of using an educational aid for facilitating the instruction of learners in the ability to read comprising, in combination:

an ordered set of instructional elements for use seriatim according to a teaching plan, each element including:

background means having indicia thereon;

said indicia including an ordered series of sentence indicia;

a first one of said sentence indicia including a first alphabetic indicia representing a first single high-frequency word to be learned and at least a first rebus indicia representing a word equivalent cooperating with the high frequency word to help form a first sentence to facilitate the decoding said first alphabetic indicia in accordance with a teaching plan;

a second one of said sentence indicia including a second alphabetic indicia representing said single high-frequency word to be learned for repetition purposes and at least a second rebus indicia representing a word equivalent cooperating with the high frequency word to help form a second sentence to facilitate the decoding said second alphabetic indicia in accordance with the teaching plan;

a third one of said sentence indicia including a third alphabetic indicia representing a second single high-frequency word to be learned and at least a third rebus indicia representing a word equivalent cooperating with the second high-frequency word to help form a third sentence to facilitate the decoding said third alphabetic indicia in accordance with the teaching plan, wherein said third one of said sentence indicia includes a fourth alphabetic indicia representing said single high-frequency word to be learned for reinforcement purposes;

a fourth one of said sentence indicia including a fifth alphabetic indicia representing said second single high-frequency word to be learned for repetition purposes and at least a fourth rebus indicia representing a word equivalent cooperating with said second high-frequency word to help form a fourth sentence to facilitate the decoding said fifth alphabetic indicia in accordance with the teaching plan;

displaying the first one of said sentence indicia to the learner according to the teaching plan;

directing the attention of the learner to said first alphabetic indicia representing said single high-frequency word to be learned for explaining said word to the learner;

displaying the second one of said sentence indicia to the learner;

requesting the learner to read said second sentence to facilitate the decoding of said second indicia;

displaying the third one of said sentence indicia to the learner;

requesting the learner to read said third sentence to facilitate the decoding said third alphabetic indicia; and

repeating the displaying and requesting steps for the fourth and any additional ones of said sentence indicia;

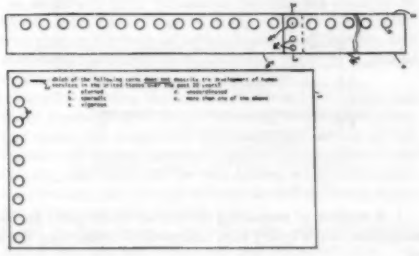
whereby each subsequent sentence indicia includes at the most only one new alphabetic indicia representing a single new high-frequency word to be learned and possibly some alphabetic indicia representing one or more previously learned high-frequency words.

4,437,838

APPARATUS FOR PREPARING EXAMINATIONS

Robert T. Tauber, and Randolph T. Tauber, both of Erie, Pa., assignors to TTK Communication Products, Erie, Pa.

Filed Apr. 26, 1982, Ser. No. 371,736
Int. Cl.³ G09B *1/10*
U.S. Cl. 434—363 **2 Claims**



1. Equipment for preparing an examination of a plurality of questions comprising a plurality of rectangular cards each carrying a single question and with space for non-reproducing administrative information such as instructions for grading answers and records of student response to the question, said cards being of uniform size having along the left-hand margin a vertical row of a plurality of uniformly spaced holes and an index mark of reproducible ink indicating the top line and the left-hand margin of the question, and a card holder comprising a strip of length equal to or greater than the length of the page on which the examination questions are to be assembled, said strip having a left-hand margin underlying and covered by the left-hand margin of the cards and a plurality of uniformly spaced pins registering with and frictionally gripping the holes in the cards, the cards being laid single fashion on the strip with the holes over the pins and with the question on each card exposed and with the remainder of the card covered by the card containing the following question, whereby a photocopy of the cards assembled on the card holder after placing on the photocopy the reproducible number for each question on its index mark provides a master copy of a page of examination questions which may be reproduced to provide multiple copies.

4,437,839

CHALKBOARD WITH HINGED CHALK RAIL

John H. Stempel, 117 N. Blanco, Coleman, Tex. 76834

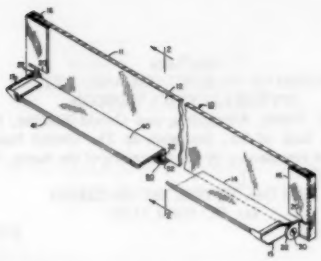
Filed Apr. 19, 1982, Ser. No. 369,417
Int. Cl.³ B43L *21/04*
U.S. Cl. 434—417 **14 Claims**

1. In a chalkboard having a board presenting an indicia receiving front surface with upright lateral margins, a chalk rail comprising

a ledge coextensive with the chalk rail and adjacent the lower margin of the indicia receiving board and of sufficient transverse width to receive markers and erasers,

upright flanges projecting perpendicularly from the lower end portions of the upright lateral margins of said board adjacent the ends of said chalk rail,

hinge pins rotatably connecting said ends of said rail to the flanges so as to permit pivotal movement of said rail relative to said board, and



means for limiting pivotal movement of said rail between an up position folded contiguous and substantially parallel to said board and a down position substantially perpendicular to said board whereby said chalkboard is packagable for shipment in its up position and functions in its down position to provide the supporting ledge,

upright frame members at said upright lateral margins of said board,

said upright flanges being integral with the lower end portions of the frame members.

4,437,840

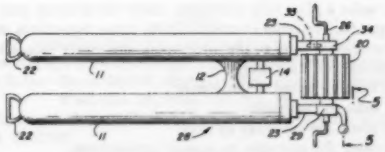
SWIMMING WHEEL APPARATUS

Makram I. Filippos, 102 Oakland Ave., Jersey City, N.J. 07306

Filed Oct. 30, 1981, Ser. No. 316,771

Int. Cl.³ A63B *35/04*

U.S. Cl. 440—27 **2 Claims**



1. A swimming wheel apparatus comprising in combination: a frame; a pair of hollow pontoons separated by said frame and made an integral part thereof, so that said pontoons and said frame together physically touch and support a reclining rider; a paddle wheel powered by said rider for propelling said craft on a water surface, said paddle wheel disposed on straight beams extending from and colinear with said pontoons; a pair of stirrups disposed at one end of said pontoons for said rider's feet, wherein means to steer said craft include a mechanism to tilt said paddle wheel, said mechanism utilizing a manually rotatable knob connected by a flexible shaft to a screw which supports a bearing block which further supports one end of a paddle wheel shaft.

4,437,841

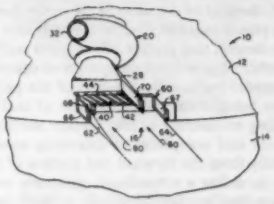
OUTBOARD JET DRIVE STEERING MECHANISM

Richard C. Stallman, 1311 Dayton Ave., Alameda, Calif. 94501

Filed Nov. 4, 1981, Ser. No. 317,999

Int. Cl.³ B63H *11/02*

U.S. Cl. 440—42 **4 Claims**



1. A steering control apparatus for an outboard engine driven jet boat comprising

a boat hull having a bottom adapted to plane along the surface of the water,

a jet outboard propulsion apparatus having means defining a water inlet port and means defining a water outlet port, said water inlet port having an upper lip and a lower lip,

means defining a conduit disposed along said hull beginning proximate the stern of said hull and extending longitudinally forward in said hull,

said upper lip of said water inlet port disposed proximate the extended upper surface of said conduit, and said lower lip of said water inlet port disposed proximate the extended bottom surface of said hull,

means for extending said conduit sternward proximate said inlet port comprising

a channel top member having a pair of side skirts depending downwardly therefrom to partially enclose said upper lip of said inlet port, and

means for preventing entrainment of air into said inlet port during a turning maneuver of said jet boat.

4,437,842

SURFING DEVICE

Terrence E. Connor, 8146-D Imperial Ave., Lemon Grove, Calif. 92045

Filed Mar. 5, 1982, Ser. No. 354,155

Int. Cl.³ A63C *15/00*

U.S. Cl. 441—65 **6 Claims**

1. A device for facilitating an enhancing bodysurfing, adapted to receive a hand of the surfer, and selectedly supporting one or both hands of the surfer so that the upper arms and head of the surfer are raised somewhat during surfing, whereby increased speed and buoyancy through the water are provided, the device comprising:

an elongated, buoyant planar member having its widest portion at approximately the midpoint of the length

thereof and with the sides of the member curving inwardly toward the front and rear to provide a streamlined configuration;

a compartment located at the upper forward end of said planar member, the major portion of said compartment being located forwardly of a transverse horizontal midline of said planar member, said compartment having an opening in the rear thereof to receive the hand of the surfer with the heel of the palm of the surfer being located upon said planar member at approximately said transverse midline thereof, that portion of the upper surface of the planar member adjacent said compartment opening thus defining a support surface for the heel of the palm of the surfer, there being a substantial portion of said planar member trailing rearwardly of said support surface; and

a top on said compartment extending upwardly and rearwardly from the forward end portion of the planar member, to define a streamlined, generally arched outer surface extending approximately to and above said planar transverse midline, thus to form an additional, second support surface for the other hand of the surfer;

whereby said planar member support surface is employed by one hand of the surfer during surfing to raise somewhat the upper arms and head of the surfer, thus to increase buoyancy and speed through the water, the other hand of the surfer being selectively placed upon said compartment top or trailing alongside the body of the surfer.

4,437,843

DEVICE FOR SELF-ACTING LIMITATION OF SPEED OF ASCENDING DIVERS

Theo Birle, Quellenweg 11, 8531 Markt Erlbach, Fed. Rep. of Germany

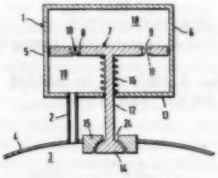
PCT No. PCT/DE81/00075, § 371 Date Jan. 22, 1982, § 102(e) Date Jan. 22, 1982, PCT Pub. No. WO81/03313, PCT Pub. Date Nov. 26, 1981

PCT Filed May 22, 1981, Ser. No. 346,082

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019993; Jul. 24, 1980, 3028070

Int. Cl.³ B63C 9/12

U.S. Cl. 441—96 **17 Claims**



1. Apparatus for limiting the ascending speed of a diver in air-filled diving equipment comprising means defining a chamber, a separating means dividing said chamber into a first compartment and a second compartment, communicating means communicating said first compartment with the inner space of said diving equipment, said separating means being movable so as to provide variable volumes for said first and second compartments, a restriction means between said first and second compartments, a check valve between said first and second compartments, and a valve means comprising a closure member connected to said separating means and movable with said separating means, said valve means further comprising a valve seat cooperable with said closure member for opening and closing said valve means, said valve means being operably connected with the inner space of said diving equipment so that when said valve means is open, the pressure within the inner space of said diving equipment is relieved to decrease the rate of ascent of said diver, said valve means being opened when the pressure in said first compartment exceeds a value which is related to the passage of fluid through said restriction means from said first compartment to said second compartment.

4,437,844

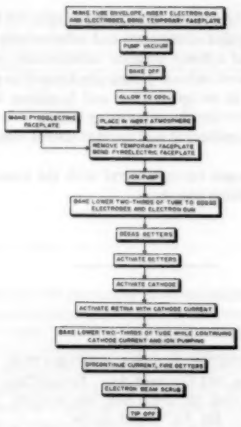
METHOD OF MAKING ORGANIC-RETINA (PYROELECTRIC) VIDICON

Ferdinand C. Petito, Alexandria, and Gerald Klauber, Fredericksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 30, 1981, Ser. No. 335,921

Int. Cl.³ H01J 31/49

U.S. Cl. 445—5 **3 Claims**



1. A method of making an organic-retina vidicon which includes the following steps:

(a) make a glass tube envelope, insert the electron gun, the getters, and other electrodes in the lower two-thirds of the envelope, bond to the envelope a temporary faceplate to produce a tube assembly;

(b) vacuum pump the assembly;

(c) bake the assembly;

(d) allow the assembly to cool;

(e) place the assembly in an inert atmosphere;

(f) make an organic-retina faceplate and place in the inert atmosphere containing the assembly;

(g) remove the temporary faceplate and bond the organic-retina on the tube envelope to produce a new assembly;

(h) vacuum pump the new assembly;

(i) bake the lower two-thirds of the new assembly;

(j) heat the getters to degas same;

(k) activate the electron gun cathode by heating same;

(l) activate the retina by heating with anode current;

(m) bake the lower two-thirds of the new assembly while continuing anode current;

(n) discontinue anode current, fire getters;

(o) electron beam scrub the retina and other tube electrodes;

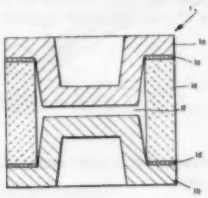
(p) tip-off the envelope.

4,437,845

METHOD FOR MANUFACTURING A GAS-FILLED DISCHARGE TUBE FOR USE AS TRANSIENT PROTECTION

C. Arne Schleimann-Jensen, Stockholm, Sweden, assignor to TII Industries, Inc., Copiague, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,485
The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.
Int. Cl.³ H01T 21/00
U.S. Cl. 445—39 6 Claims



1. A method for manufacturing a gas-filled discharge tube, designed, e.g., as transient protector, containing tube components comprised of at least two electrodes and an insulating body holding the electrodes joined vacuum-tight, with the electrodes and the insulating body dimensioned and arranged in such a way that at least one discharge gap is present in the tube, comprising the steps of:

A. sealing at a suitable temperature the components of the tube at substantially atmospheric pressure in a light gas mixed with another gas which, in view of the intended function of the tube is desirable and heavier than the first-mentioned gas, and

B. reducing the pressure exteriorally of said tube below atmospheric pressure so as to obtain a pressure lower than that pressure at sealing temperature, while simultaneously lowering the temperature to such extent that the heavy gas can only to an insignificant degree penetrate the tube walls through diffusion and/or effusion, whereas the enclosed light gas can diffuse and/or be effused through the walls such that, as a result of the partial or total pressure difference, it will migrate through the walls of the tube, thus causing a reduction in the total gas pressure inside the tube.

4,437,846

SPEED LIMITING ROTARY COUPLING

Istvan Ragaly, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

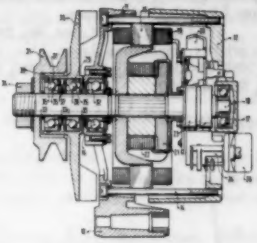
Filed Oct. 20, 1980, Ser. No. 198,967
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942737
Int. Cl.³ F16D 7/06
U.S. Cl. 464—36 14 Claims

1. Electric generator for a motor vehicle, having a shaft driven from the vehicle engine, having a fan for cooling the generator and having, seated on said shaft a friction coupling for driving said fan with a speed-limiting drive characteristic for said fan, which fan comprises:

first and second bearings each having rolling bearing elements, a first bearing race ring (26,28; 126, 128; 226,228) supported on said generator shaft and a second bearing race ring (27,29; 127,129; 227,229) affixed to said fan;

said first and second ring of each said bearing being constituted so as to hold said bearing elements, as the latter roll, at a constant spacing from said generator shaft, and

spring action pressure-producing means (37) for exerting pressure parallel to the axis of said shaft mounted for exerting said pressure as a relative force acting on said



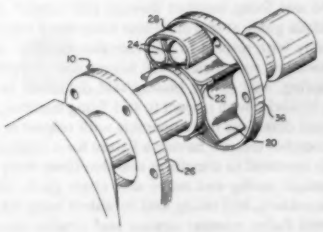
second rings (27,29; 127,129; 227,229) of both said bearings.

4,437,847

FLEXIBLE COUPLING

Michael M. Calistrat, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 146,253, May 5, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,369
Int. Cl.³ F16D 3/74
U.S. Cl. 464—74 6 Claims



1. An improved flexible coupling for transmitting torque between a driving and driven shaft, comprising:

(a) a plurality of elastomeric elements;

(b) first hub means fixed to a shaft, said first hub means having blade means comprised of a plurality of blades engaging said elastomeric elements;

(c) sleeve means comprised of a plurality of cylindrical segments having radially inwardly extending straight end portions circumferentially arranged about said first hub means, the end portions of adjacent segments abutting over a substantial area thereof, said segments being positioned radially toward said blade means to maintain said plurality of elastomeric elements in engagement with said blades during rotation of said coupling;

(d) retainer means having chamfered guide means engaging said sleeve means; and

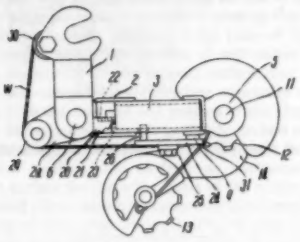
(e) second hub means fixed to a second shaft placed in substantial alignment with said first shaft, said second hub means having chamfered guide means engaging said sleeve means and being fixed to said retainer means by fastening means, whereby rotation of one of said hub means will cause rotation of the other hub means through said elastomeric elements.

4,437,848

DERAILLEUR FOR A BICYCLE

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 9, 1981, Ser. No. 241,642
Claims priority, application Japan, Mar. 15, 1980, 55-33684; Sep. 19, 1980, 55-134347[U]; Sep. 19, 1980, 55-134348[U]; Sep. 19, 1980, 55-134349[U]
Int. Cl.³ F16H 9/00
U.S. Cl. 474—82 14 Claims



1. A derailleur for shifting a chain among the sprockets of a multistage sprocket assembly comprising:

(a) a fixing member fixed to a frame of the bicycle;

(b) a derailleur body being provided with a four link parallelogram mechanism comprising a support member, a pair of linkage members connected pivotably to said support member, and a movable member which has a chain guide and is connected pivotably to said linkage members, and with a return spring for biasing said movable member unidirectionally with respect to said support member,

said derailleur body being supported swingably with respect to said fixing member through said support member, said chain guide at said derailleur body being supported swingably with respect to said movable member, said movable member and chain guide having therebetween a tension spring, said spring biasing said derailleur body counterclockwise with respect to said fixing member, a member at said derailleur body operable with respect to said support member thereat, having a fixture for a control wire which is operated to transform said derailleur body against said return spring and move said chain guide axially of said sprockets, and swing said derailleur body with respect to said fixing member against said tension spring, to move said chair guide radially of said sprockets; and

(c) an intermittent feed mechanism interposed between said fixing member and said derailleur body, said mechanism being operated by said wire to swing said derailleur body intermittently corresponding to the speed change stages with respect to said fixing member, and to transform said derailleur body after a swinging motion thereof.

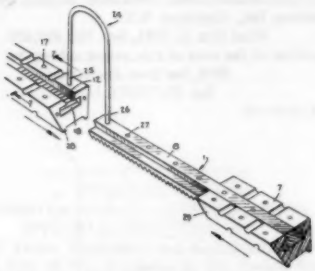
4,437,849

REPLACEMENT DRIVE BELT

Winfred M. Berg, East Rockaway, N.Y., assignor to Winfred M. Berg, Inc., East Rockaway, N.Y.

Filed Jun. 12, 1979, Ser. No. 47,716
Int. Cl.³ F16G 7/00
U.S. Cl. 474—256 15 Claims

1. A replacement drive belt comprising an elongated belt portion of indeterminate length adapted for being cut adjacent to one end for forming loops of varying sizes and having coupling means for connecting its opposite ends, said coupling means comprising a first elongated ratchet tie having immediately adjacent ratchet teeth and extending from the belt end opposite to said cut end and adapted to adjustably engage and to form a connection with second ratchet teeth positioned



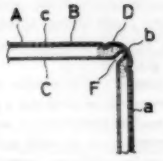
immediately adjacent to each other and extending along said belt from the cut end.

4,437,850

PROCESS OF MANUFACTURING OF REINFORCED CORRUGATED CARDBOARD TYPE PACKAGING CONTAINER

Masayuki Ono, Saitama, Japan, assignor to Kabushiki Kaisha Tomoku, Hokkaido, Japan

Filed Oct. 13, 1981, Ser. No. 310,817
Claims priority, application Japan, Oct. 14, 1980, 55-142482
Int. Cl.³ B31B 1/74, 49/02
U.S. Cl. 493—89 3 Claims



1. A process of manufacturing a reinforced corrugated cardboard-type of packaging container, comprising the steps of providing a corrugated core liner and a pair of side liners, adhering one side surface of the corrugated core liner to one side liner with an aqueous adhesive solution, applying an aqueous adhesive solution to the other side surface of the corrugated core liner, further applying a reinforcing agent to produce a reinforced region, adhering the other side liner to the other side of the corrugated core liner, heating the two side liners and the corrugated core liner, thereby adhering the side liners and the corrugated core liner together by gelatinizing the aqueous adhesive solutions to form a corrugated cardboard while the reinforcing agent remains unhardened, forming scored lines in said reinforced region before the hardening of the reinforcing agent is completed, and folding the corrugated coardboard in said reinforced region to form a packaging container.

4,437,851

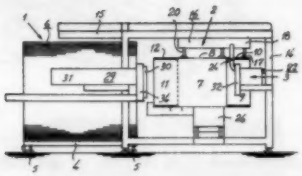
METHOD AND APPARATUS FOR HANDLING AND SETTING UP LARGE SIZE SLIT-BOXES

Sten A. Salenbo, Berlinggatan 3, 244 00 Kävlinge, Sweden

Filed Jun. 22, 1981, Ser. No. 275,691
Claims priority, application Sweden, Jun. 25, 1980, 8004702
Int. Cl.³ B31B 5/02
U.S. Cl. 493—124 9 Claims

6. An apparatus for handling and setting up large slit-boxes of the type in which the slit-box is formed by a generally tubular slit-box blank having sides, two of which sides have

opposed bottom inner flaps connected thereto and two other sides of which have opposed outer bottom flaps connected thereto, comprising; a magazine for receiving a pile of generally flat slit-box blanks, a catcher means displacable between a first position above the magazine and a second position to the side thereof for setting up the slit-box by successively engaging the uppermost slit-box blank in the magazine and moving the same to a setting up position, said catcher means including a catcher carriage which is displaceable between a position above the magazine and setting up position, said catcher carriage including a first set of catcher devices intended to engage one of the sides of the slit-box blank which faces upwardly and also engage the bottom flap connected to the first said side,



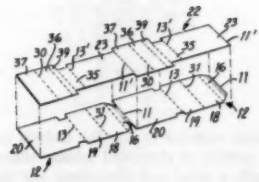
which bottom flap is an outer bottom flap, further catcher devices positioned to engage another side of the slit-box blank adjacent to the first said side, which second side also faces upwardly when the slit-box blank is positioned in the magazine, means for moving the catcher carriage between said two positions, means for actuating the catcher devices and means for controlling operation of the catcher devices so that the second catcher devices associated with the second side of the slit-box container disengage that side before the first set of catcher devices disengage the first said side, means for folding in the two inner bottom flaps into the space between the two opposed outer bottom flaps and means for folding in the outer bottom flaps over the folded in inner bottom flaps.

4,437,852

METHOD OF PRODUCING MAILER WITH SELF CONTAINED REPLY ENVELOPE

Kurt E. Volk, Jr., Westport; Everett H. Herbert, Fairfield, and John W. Stenner, Orange, all of Conn., assignors to Kurt H. Volk, Inc., Milford, Conn.

Filed Dec. 14, 1981, Ser. No. 330,320
Int. Cl.³ B31B 49/04
U.S. Cl. 493—216 **19 Claims**



1. A method for producing an article suitable for mailing that consists of an outer envelope containing a plurality of enclosure sheets and a preformed reply envelope, the method comprising the steps of:

(a) mating in a superposed aligned configuration a first composite sheet consisting of:

i. an outer envelope sheet defining a flap, a front panel and a rear panel, and integral therewith

ii. a first enclosure sheet joined along a transverse line to said rear panel;

and a second composite sheet consisting of:

i. a second enclosure sheet, and integral therewith

ii. a reply envelope sheet defining a flap, a front panel, and a rear panel, said reply envelope sheet joined along a transverse line to said second enclosure sheet;

(b) folding the composite sheets to superpose the reply envelope rear panel with the reply envelope front panel;

(c) bonding the longitudinal edges of the front and rear reply envelope panels to form a reply envelope pocket;

(d) further folding the composite sheets to position the reply envelope, first enclosure sheet and second enclosure sheet between the front and rear panels of the outer envelope sheet;

(e) bonding the longitudinal edges of the outer envelope front and rear panels to form an outer envelope pocket containing the reply envelope, first and second enclosure sheets; and

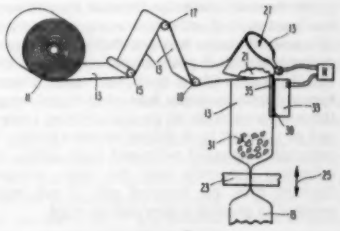
(f) while the outer envelope flap is open, simultaneously separating the reply envelope from the second enclosure sheet, and the first enclosure sheet from the outer envelope rear panel, to thereby provide an envelope containing separate first and second enclosure sheets, and a separate preformed reply envelope.

4,437,853

SEAM SEALING DEVICE AND TECHNIQUE

Bruce E. Metz, Wilmington, Del., assignor to Athena Controls Inc., Plymouth Meeting, Pa.

Filed Aug. 19, 1981, Ser. No. 294,336
Int. Cl.³ B65B 9/08
U.S. Cl. 493—302 **5 Claims**



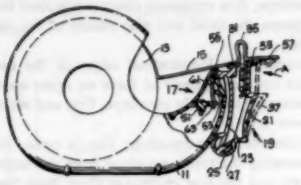
1. An arrangement for producing a sealed seam of a plastic package, which plastic package is formed in part by pulling at least a portion of a sheet of plastic material, which has first and second edge sections, through a forming means whereby said first edge section is guided to form an overlay section with said second edge section, comprising in combination: heat seal bar means disposed to come in contact, along said overlay section, with the side of the plastic material which becomes the outside of the package as said plastic material moves along said heat bar means, said heat seal bar means formed to generate heat and transfer said heat to said overlay section of said plastic material; tongue element means formed and disposed to form a slit between a first side thereof and said heat seal bar means; and flexible heating means secured to said first side of said tongue element and disposed to come in contact, along said overlay section, with the side of the plastic material which becomes the inside of the package to transfer heat to said overlay section of said plastic material as said plastic material moves within said slit, whereby a seam can be rapidly formed along said overlay section in response to the direct heat transfer from said heat seal bar and to the direct heat transfer from said flexible heating means.

4,437,854

TAPE ROLL HOLDER HAVING TAB FORMING DEVICE

Jack P. Knoop, 326 Avenida Arboles, San Jose, Calif. 95123

Filed Aug. 20, 1981, Ser. No. 294,533
Int. Cl.³ B26F *3/02*
U.S. Cl. 493—353 **1 Claim**



1. In combination, a dispenser of adhesive tape and a device for forming a tab in the tape, comprising,

roll holder means for supporting a roll of the tape, said roll holder means having a forward upwardly extending tear-off station establishing a tape dispensing path, and

a molded polymer one-piece tab forming device detachably connectable to said roll holder means in said tape dispensing path, said device having a pair of upwardly extending forward and rearward struts and a spring, said struts having upper and lower extremities, respectively, and being connected together at said lower extremities by said spring, said struts being biased by said spring to diverge upwardly whereby said extremities normally are in a spaced open position in the direction of said tape dispensing path, said forward strut being movable in the tape dispensing path toward said rearward strut against the bias of the spring to a closed position proximate to the tear-off station of the roll holder to thereby form a tab in said tape,

said tear-off station of the roll holder means having integrally formed internally disposed anchor members, said rearward strut of said device extending into the interior of said tear-off station and detachably engaging said anchor means whereby to enable rapid coupling of the device to the dispenser without tools, said upper extremity of the forward strut having at least one integral tang on the side thereof between the struts and defining therewith a slot, and an inverted hook shaped member having one portion detachably engaged with said tang within the slot and extending forwardly over the upper extremity of the forward strut, the forward end of said member being serrated to provide a tape cutting edge.

4,437,855

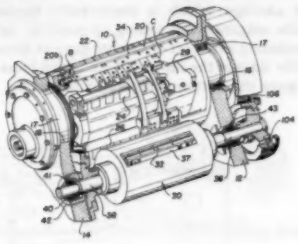
REDUCTION OF CUTOFF LENGTH FOR FOLDING MECHANISMS

Lee Bullen, Dallas, Tex., assignor to Publishers Equipment Corporation, Carrollton, Tex.

Continuation of Ser. No. 133,342, Mar. 24, 1980, abandoned. This application Apr. 21, 1982, Ser. No. 370,159
Int. Cl.³ B65H *45/16*
U.S. Cl. 493—424 **3 Claims**

1. A method of reducing the cutoff length of an existing paper cutting and folding unit operable only at a single cutoff length, said folder having a main frame, a folding cylinder rotatably supported thereon, a cutting cylinder rotatably supported thereon at a fixed non-changeable distance from said folding cylinder, said folding cylinder including a body portion supporting a synchronously timed tucking blade internally thereof, operable pin assemblies mounted adjacent the outer periphery of said body portion, and adjustable bands mounted to define at least a portion of the outer circumferential surface of said folding cylinder, said cutting cylinder including a body portion supporting cutting assemblies in pockets formed adjacent the outer periphery thereof, the steps comprising,

removing said pin assemblies and adjustable bands from said body of said folding cylinder, and removing said cutting assemblies from said pockets formed in said body of said cutting cylinder, reducing the diameter of said body of said folding cylinder by permanently removing material therefrom, increasing the size of said pockets formed in said cutting cylinder by permanently removing material from the body thereof, reinstalling said pin assemblies and



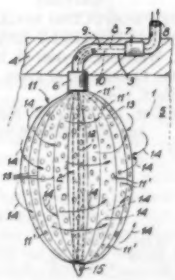
adjustable bands upon the body of said folding cylinder, reinstalling the cutting assemblies in said pockets in said body of said cylinder, and resupporting said cutting and folding cylinders within said main frame with at least one of said cylinders repositioned with respect to the other upon said main frame at a different, non-changeable distance from the other thereof shorter than their original distance from one another.

4,437,856

PERITONEAL CATHETER DEVICE FOR DIALYSIS

Alberto Valli, Via Cappelletta, 29, Cogliate (Province of Milano), Italy

Filed Feb. 9, 1981, Ser. No. 232,495
Int. Cl.³ A61M *25/00, 1/03*
U.S. Cl. 604—29 **4 Claims**



1. A peritoneal catheter device for dialysis comprising a rigid catheter portion of elongated tubular shape having an interior, a length, a distal and a proximal end thereof and a plurality of openings spaced apart from each other along the entire length of the catheter portion, said tubular catheter portion being closed at said distal end and defining a cul-de-sec, a longitudinal partition wall extending within said catheter portion along the entire length thereof and dividing the catheter interior into two separated delivery and discharge conduits, supply and discharge ducts for a dialysing liquid connected at said proximal end of said rigid catheter portion with said separated conduits, an inflatable and expandable membrane generally of tubular shape surrounding said catheter portion throughout its length and fixed near said distal and proximal end to define an expandable chamber between said catheter and said inflatable and expandable membrane adapted to be

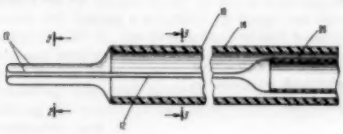
filled with dialysing liquid, said inflatable membrane having perforations defining means for the passage of said dialysing liquid therethrough and in use expanding to a substantially balloon-like shape, said catheter being adapted in use to be inserted in a body cavity such as the peritoneal cavity between the bends of the intestine to deliver and draw the dialysing liquid through the openings of said catheter.

4,437,857

METHOD AND APPARATUS FOR TRAVERSING BLOOD VESSELS

Seth Goldstein, Bethesda, Md., and Robert Jones, Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Mar. 19, 1979, Ser. No. 22,219
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—53 **2 Claims**



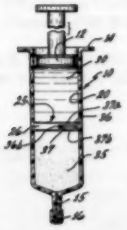
1. The method of gaining access to a relatively inaccessible region of a blood vessel comprising entering the vascular system with the leading end of a primary flexible catheter tube, at a point of entry remote from said region, working the primary catheter tube through the vascular system so that its leading end approaches said region and then everting a second flexible catheter tube contained within said primary tube from the leading end of the primary tube to approach more closely to said region.

4,437,858

SEPARATOR DISC AND HYPODERMIC SYRINGE INCORPORATING THE SAME AND METHOD

Perla J. Ty, 3640-B S. Main St., Santa Ana, Calif. 92707

Continuation-in-part of Ser. No. 869,798, Jan. 16, 1978, abandoned. This application Apr. 22, 1982, Ser. No. 370,688
Int. Cl.³ A61M *5/18*
U.S. Cl. 604—90 **19 Claims**



1. Apparatus for separately storing and admixing at least two materials, comprising:

at least one tubular barrel means having an effective bore of essentially uniform diameter along the length thereof, a plunger at one end of said tubular barrel means adapted to be moved through said tubular barrel means,

disc means positioned in said tubular barrel means and in sealing engagement with the wall thereof along the periphery of said disc and operative to divide said tubular barrel means into at least two separate chambers,

said disc being so constructed and arranged as to be response to pressure and/or force conditions on one side thereof to form a communicating path between said chambers as a result of deflection of at least a portion of said disc away from said tubular barrel means, and

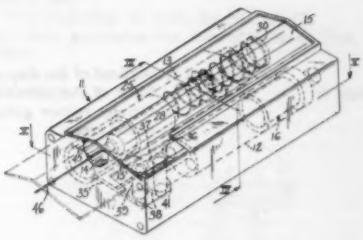
said bore being essentially free of radially inwardly extending protrusions whereby said plunger may move freely and easily through said bore.

4,437,859

HYDRAULIC SYRINGE DRIVE

Craig M. Whitehouse, New Haven; Nigel Cox, Cheshire; Allan G. Burt, East Haven, and Daniel R. Snyder, New Haven, all of Conn., assignors to DRS Infusion Systems, Inc., New Haven, Conn.

Filed Aug. 3, 1981, Ser. No. 287,861
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—131 **23 Claims**



1. An automatic drive for a hypodermic syringe having a barrel for containing a fluid medicament and a plunger adapted to eject said medicament, the drive comprising a housing, means in said housing for supporting a syringe in operative position, first and second variable volume chambers each having a movable wall element, a conduit interconnecting said chambers to constitute a constant voluem capacity, a substantially incompressible fluid filling said capacity, means associated with the first chamber for forcing fluid contained therein into the second chamber, a syringe driver associated with one of the movable wall elements and operatively engageable with the syringe plunger, means biasing the movable wall element of the second chamber in a fluid-expelling direction, adjustable means associated with the conduit for accurate metering of the fluid flow from the second chamber to the first chamber, said adjustable means automatically operative to adjust the fluid flow during the operation of said automatic drive to maintain said fluid flow constant responsive to ambient pressure and to pressure changes upstream and downstream of said adjustable means.

4,437,860

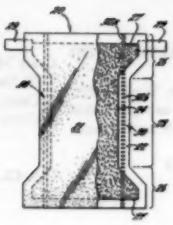
DISPOSABLE DIAPER WITH ELASTICIZED LEG OPENINGS

Wayne C. Sigl, and Richard H. Frick, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 21, 1981, Ser. No. 294,843
Int. Cl.³ A41B *13/02*
U.S. Cl. 604—385 **7 Claims**

1. In a disposable diaper having an absorbent batt interposed between a fluid permeable facing sheet and a fluid impervious backing sheet and having a generally hour glass shape with a narrow centrally disposed crotch portion and wider waistband portions at the ends thereof, the improvement comprising, prestretched elastic means extending along the length of the diaper at each side, said elastic disposed outboard of the absorbent batt in the crotch portion and across the laterally extending ears of the absorbent batt in the waistband portions of the diaper, adhesive means for securing said elastic to at least one of said facing sheet and backing sheet substantially along the

entire length of said diaper, said adhesive being applied in the form of longitudinally spaced apart concentrations, said concentrations in the waistband portion being substantially larger and more closely spaced than said concentrations in the crotch



portions of the diaper to substantially decrease the retractive force of the stretched elastic in the waistband portions to thereby reduce gathering thereof and diminish undesirable elastic creep.

4,437,861

COAL-DEASHING PROCESS

Tetsuo Ishizuka; Hiroshi Hotta, and Yoshichika Nishimura, all of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Feb. 16, 1983, Ser. No. 467,063

Claims priority, application Japan, Feb. 19, 1982, 57-26586; Feb. 19, 1982, 57-26587; Feb. 19, 1982, 57-26588; Feb. 19, 1982, 57-26589

Int. Cl.³ C10L *5/04, 10/06*

U.S. Cl. 44—1 R 5 Claims

1. A process for deashing coal containing inorganic impurities which comprises the steps of:

preparing an aqueous suspension of finely divided particles of coal mixed with said impurity particles;

adding to said suspension an effective amount of a water-soluble or water-dispersible copolymer having a molecular weight from about 100,000 to about 30,000,000 of a hydrophilic monomeric unit having a solubility in water greater than 15% by weight at 20° C. and a hydrophobic monomeric unit having a solubility in water less than 10% by weight at 20° C., the proportions of said hydrophilic unit and said hydrophobic unit in said copolymer being a ratio from 99:1 to 20:80 parts by weight;

flocculating said coal particles selectively as flocs while leaving the remainder containing said inorganic impurities suspended; and

recovering said flocs from said suspension.

4,437,862

WATER-PROOF BRIQUETTE AND METHOD FOR PRODUCTION THEREOF

Kyu B. Whang, Seoul, Rep. of Korea, assignor to International Monopoly Association, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,541

Claims priority, application Japan, Oct. 6, 1981, 56-158127

Int. Cl.³ C10L *5/10, 11/00*

U.S. Cl. 44—6 19 Claims

10. A method for production of a water-proof briquette which comprises mixing an oxidizing agent with powders of a combustible solid material, adding a solution of brittle nitrocotton and/or cellulose acetate to the mixture followed by further mixing, compression-molding the resultant mixture and then applying at least once a solution of brittle nitrocotton and/or cellulose acetate on the surface of the molded product.

4,437,863

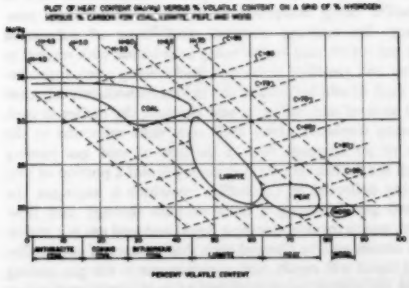
PEAT FUEL SLURRY

Brooks M. Whitehurst, 1983 Hoods Creek Dr., New Bern, N.C. 28560, and Donald F. Clemens, 1701 Sulgrave Rd., Greenville, N.C. 27834

Filed Feb. 5, 1982, Ser. No. 346,161

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 3 Claims



1. A peat fuel composition (30 to 50% peat) which is a product of dispersing a ground North Carolina type peat with a moisture of 20–50% by weight in a fuel oil mixture of No. 6 fuel oil (40–50%) and No. 2 fuel oil (10–20%) and aerating said peat to entrap air in the composition.

4,437,864

PLANT WITH A REACTOR CONTAINER, PARTICULARLY FOR THE GASIFICATION OF FOSSIL FUELS

Rainer Gorris, Ratingen; Josef Hibbel, Oberhausen; Ulrich Gerhardus, Oberhausen, and Heinrich Scheve, Oberhausen, all of Fed. Rep. of Germany, assignors to Karrena GmbH, Düsseldorf; Ruhrchemi AG, Oberhausen and Ruhrkohle AG, Essen, all of, Fed. Rep. of Germany

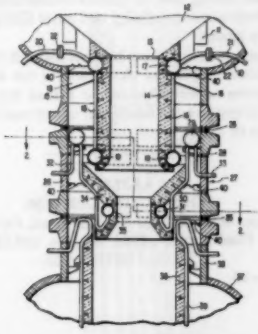
PCT No. PCT/DE81/00044, § 371 Date Nov. 9, 1981, § 102(e) Date Nov. 9, 1981, PCT Pub. No. WO81/02743, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 13, 1981, Ser. No. 321,171

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009851

Int. Cl.³ C10J *3/20*

U.S. Cl. 48—62 R 18 Claims



1. A plant for the gasification of fossil fuels which includes a reactor container and a further plant component attached to said container, said reactor container having a longitudinal axis, a fireproof lining which determines the inner cross-sectional area of said container, a discharge opening and a connecting part extending outwardly from said discharge opening, said connecting part having an outer casing surrounding a fireproof lining thereof and forming an annular space therebetween;

wherein, the improvement comprises an intermediate ring interposed between said connecting part and said further plant component for attaching said connecting part to said further plant component, said intermediate ring including a fireproof lining having a reduced inner cross-sectional area at a portion thereof which is less than the inner cross-sectional area of the fireproof lining of said reactor container, said reduced cross-sectional area being the smallest cross-sectional area of the connection between said reactor container and said further plant component;

and wherein said intermediate ring further includes an outer casing surrounding the fireproof lining thereof and forming an annular space therebetween, the outer casing of said intermediate ring having one end adjacent the outer casing of said connecting part and being sealingly engaged therewith;

and which plant further comprises a support structure attached to the outer casing of said intermediate ring and the fireproof lining of said ring for suspending the fireproof lining of said intermediate ring.

4,437,865

FLEXIBLE BACKING MATERIAL FOR USE IN COATED ABRASIVES

Dhan N. Parekh, Williamsville, and Paul R. Schweyen, Tonawanda, both of N.Y., assignors to Carborundum Abrasive Company, Niagara Falls, N.Y.

Filed Aug. 27, 1982, Ser. No. 412,149
Int. Cl.³ C09K 3/14
U.S. Cl. 51—298 21 Claims

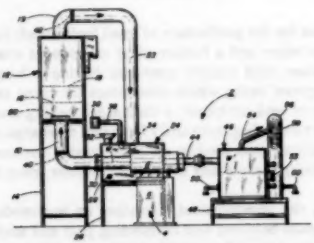
1. Flexible sheet material comprising:
(a) a straight warp fabric, including:
(i) an array of warp yarns that extend generally parallel to one another in a first plane,
(ii) an array of weft yarns that extend generally parallel to one another in a second plane adjacent and parallel to said first plane, said weft yarns extending generally transversely of said warp yarns, and
(iii) a stitching yarn network joining said array of warp yarns and said array of weft yarns to one another;
(b) a dipsize of flexible polymeric material that coats and at least partially impregnates all yarns of said straight warp fabric;
(c) an intermediate filling coat of phenol formaldehyde resin/latex;
(d) an outer filling coat of phenol formaldehyde resin;
(e) an adhesive coat overlying said outer filling coat securing abrasive grains;
(f) said sheet material being heat set and exhibiting not more than about 6.0 percent elongation in the direction of the warp yarns when subjected to a load less than that required to rupture the fabric and not exceeding 170 pounds per inch of fabric width.

4,437,866

POLLUTION HARNESS

Harry Pweblo, 4009 E. 131st St., Cleveland, Ohio 44105

Filed Aug. 24, 1982, Ser. No. 409,731
Int. Cl.³ B01D 47/00
U.S. Cl. 55—85 11 Claims



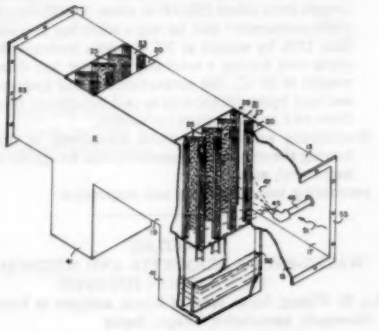
7. A process for controlling pollution resulting from flue gases like coal as produced from a combustion furnace, the steps comprising a source of combustion of flue gases like smoke, delivering said smoke to a first collector chamber and separating larger size entrained particles from said smoke in said chamber, delivering the smoke from said first collector chamber to a second collector chamber, bringing the smoke in said second collector chamber into contact with a jet-like water spray in said chamber, selectively feeding a chemical mixture into said second collector chamber in the vacinity of said jet-like water spray, delivering said smoke from said second collector chamber into a third collector chamber, said second and third collector chambers each being at least partially filled with water and continuously introducing water into said second collector chamber and delivering the water in said second collector chamber by gravity, to said third collector chamber, delivering the water from said third collector chamber to a filter means and filtering entrained particles from said water, and discharging the filter water from said filter means.

4,437,867

REMOVAL OF UNDESIRED COMPONENTS FROM GASES

Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238

Continuation of Ser. No. 796,198, May 12, 1977, abandoned.
This application Aug. 23, 1978, Ser. No. 936,078
Int. Cl.³ B01D 45/08, 50/00
U.S. Cl. 55—233 6 Claims



3. Apparatus for the continuous removal of mist from a mist-laden gas flowing at a high velocity comprising a generally horizontal flow channel through which said gas is conducted generally horizontally, a plurality of generally vertical, fibrous, high-voidage, non-capillary, free-draining bodies interposed in said flow channel, said bodies being anisotropic with respect to gas flow and gas-flow resistance, said bodies being disposed so that a portion of said gas flows through one or more of said bodies and another portion of said gas is deflected by one or more of said bodies, said bodies removing and draining, along the bodies generally vertically, the mist from said gas during the flow through and deflection, and means for suppressing the reentrainment of mist drained from said bodies into said gas.

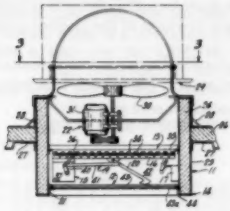
6. A scrubber for gas containing contaminants including a generally horizontal flow channel, having walls for confining a fluid in a generally horizontal path and being open at its opposite ends, for conducting said gas in a generally horizontal stream, a plurality of rows of spaced generally vertical baffles interposed in said channel in the path of said stream, each of said baffles being composed of fibrous, high-voidage, non-capillary, free-draining material, and being of substantial length and width, said bodies being anisotropic with respect to gas flow and gas-flow resistance, there being open space between each of said baffles and the baffles immediately adjacent to said each of said baffles in said channel, the baffles in each row being displaced along their row with reference to the baffles of an adjacent row, a portion of said gas passing through the baffles on which it impinges and a portion of said gas being deflected by the baffles on which it impinges, the deflected gas following a tortuous path through said flow channel, means for introducing a liquid into said gas in a region of said stream and/or channel such that contact of said baffles by said liquid will result, said contaminants in the gas passing through the baffles being captured by said liquid, and means for draining the liquid containing the captured contaminants from the gas passing down the baffles.

4,437,868

CONTROLLED EXHAUST SYSTEM FOR LOW TEMPERATURE ENCLOSURE

Ronald H. Kuhlman, N56 W21640 Silver Spring Rd., Menomonee Falls, Wis.

Filed May 24, 1982, Ser. No. 381,031
Int. Cl.³ F25D 17/06
U.S. Cl. 62—411 15 Claims



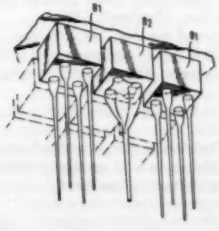
1. An exhaust apparatus for a cold storage enclosure means having an exhaust opening comprising a coupling chamber unit adapted to be mounted in sealed relationship within said opening, said exhaust chamber unit having an exterior movable closure means adapted to be moved between an open and closed position and having an interior insulated barrier wall means defining a vapor sealed closure to the coupling chamber between the closure means and the barrier wall means, opening means in said chamber to actuate said closure means and to remove said barrier wall means, and a small heating means coupled to the chamber unit and operable with the closure means in the closed position to hold the temperature in said chamber at least at the temperature necessary to ensure operation of said opening means and said heating means constructed and arranged to permit essentially free flow of air from the enclosure.

4,437,869

METHOD AND APPARATUS FOR MULTIFILAMENT GLASS STRAND

Jacques Lecron, Challes les Eaux; Maxime Manera, Jacob Bellecombette; Jean-Paul Faure, Chignin, and Jean-Pierre Renaudin, Cognin, all of France, assignors to Societe Vetrotex Saint-Gobain, Chambery, France

Continuation of Ser. No. 377,903, May 13, 1982, Pat. No. 4,391,618, which is a continuation-in-part of Ser. No. 207,712, Nov. 17, 1980, abandoned. This application May 3, 1982, Ser. No. 374,478
Claims priority, application France, Nov. 20, 1979, 7928538; May 14, 1981, 8109633
Int. Cl.³ C03B 37/025
U.S. Cl. 65—1 26 Claims



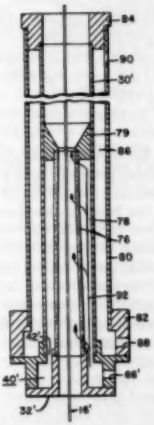
1. Apparatus for the manufacture of continuous filaments having differing cross sections by mechanical attenuation of a molten mineral material such as glass, comprising a bushing adapted to be heated by Joule's effect and having a source of supply of glass, a gas blower device directed towards the bottom of the bushing and means for attenuating the said filaments, characterized in that the bottom of the said bushing has a lower wall surface comprising a multiplicity of fiberizing centers divided into at least two different categories, each center comprising a zone perforated by a group of orifices, the centers of one category comprising means for producing one filament per center and the centers of another category comprising means for producing a plurality of filaments per center.

4,437,870

OPTICAL WAVEGUIDE FIBER COOLER

Roger A. Miller, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,375
Int. Cl.³ C03B 37/025
U.S. Cl. 65—12 2 Claims



1. An apparatus for drawing a single optical fiber comprising, in order of relative location:

a solid glass preform having at one end thereof a softened root portion wherein the preform cross-sectional area tapers to the cross-sectional area of said single fiber,

means situated along said fiber below said root portion for measuring the diameter of said fiber,

means for cooling said fiber,

means for applying protective coating material to said fiber, and

means for drawing said fiber, characterized in that said means for cooling said fiber comprises

an elongated, vertically oriented tube through which said fiber is drawn, the top of said tube being below said diameter measuring means,

a cylindrically-shaped porous member surrounding said fiber at the bottom end of said tube,

a chamber surrounding said porous member,

means supplying coolant gas to said chamber, whereby said coolant gas flows inwardly through said porous member and upwardly along said fiber, and

means situated at the top of said tube for exhausting said coolant gas.

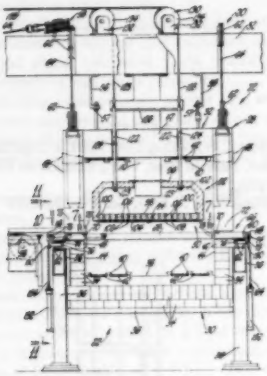
4,437,871
APPARATUS AND METHOD FOR BENDING GLASS SHEETS

Harold A. McMaster, 420 Water St., Woodville, Ohio 43469; Norman C. Nitschke, 9102 Buck Rd., and John S. Nitschke, 324 E. Second, both of Perrysburg, Ohio 43551

Division of Ser. No. 118,822, Feb. 5, 1980, Pat. No. 4,282,026, which is a continuation of Ser. No. 872,201, Jan. 25, 1978, abandoned. This application May 14, 1981, Ser. No. 263,626

Int. Cl.³ C03B *23/035*

U.S. Cl. 65—104 **4 Claims**



1. Apparatus for bending glass sheets comprising: a heating chamber for heating glass sheets to a sufficiently high temperature to permit bending thereof; a conveyor for conveying glass sheets through the heating chamber; a holder for receiving a heated glass sheet from the conveyor; said holder having a downwardly facing surface of a predetermined shape against which a differential gas pressure supports the heated sheet of glass received from the conveyor in preparation for bending; a mold having a generally open center and a curved shape over at least a substantial portion thereof with a greater curvature than said predetermined shape of the holder surface; and means for providing relative movement between the mold and the holder such that the mold is positioned below the holder to receive the heated glass sheet from the holder for substantial sag bending of the glass sheet on the mold solely under gravity.

3. A method for bending glass sheets comprising: heating a glass sheet to a sufficiently high temperature for bending; supporting the heated glass sheet against a downwardly facing holder surface of a predetermined shape; and releasing the glass sheet from the holder surface onto a curved mold having a generally open center and at least a substantial portion with a greater curvature than said holder surface such that the glass sheet bends substantially on the mold solely under gravity.

4,437,872
APPARATUS FOR BENDING AND TEMPERING GLASS SHEETS

Harold A. McMaster, 420 Water St., Woodville, Ohio 43469; Norman C. Nitschke, 9102 Buck Rd., Perrysburg, Ohio 43551, and John S. Nitschke, 324 E. Second, Perrysburg, Ohio 43551

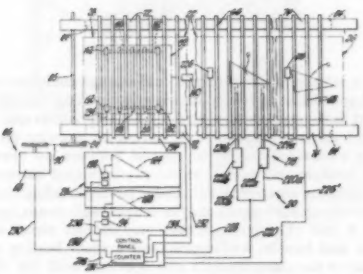
Division of Ser. No. 118,822, Feb. 5, 1980, Pat. No. 4,282,026, which is a continuation of Ser. No. 872,201, Jan. 25, 1978, abandoned. This application May 29, 1981, Ser. No. 268,535

Int. Cl.³ C03B *23/023, 23/025*

U.S. Cl. 65—104 **19 Claims**

1. A method of shaping glass sheets, comprising the steps of:
heating a glass sheet to approximately its softening point;
supporting the heat-softened glass sheet in an essentially horizontal orientation on support means;
bringing the upper surface of the glass sheet into close proximity to a flat platen in communication with a source of vacuum;
drawing a vacuum through the platen so as to retain the glass sheet on the platen;
vertically separating the platen and the glass sheet carried thereon from the support means;
bringing into vertical alignment with and beneath the glass sheet held on the platen a shaping mold having a contour defining the desired contour for the glass sheet; and
releasing the glass sheet from the platen so as to fall onto the shaping mold and conform to the contour defined by the shaping mold.

13. An apparatus for shaping glass sheets comprising:
furnace means for heating glass sheets to a softened condition;
support means for supporting glass sheets;



conveyor means for transferring heated glass sheets to the support means;
a platen having a flat perforated plate and having an enclosed interior space in communication with a source of vacuum;
means for transferring the platen into and out of close proximity to the support means so as to lift the glass sheet from the support means by means of vacuum;
a shaping mold having upwardly facing shaping surfaces defining the desired curvature and corresponding to the shape of the glass sheets; and
shuttle means for alternately bringing the platen and the shaping mold into and out of superimposed vertically spaced relationship to each other, wherein the shaping mold in the superimposed position is supported at an elevation below the platen so as to receive and shape a glass sheet dropped from the platen.

4,437,873
METHOD OF INHIBITING ALGAE

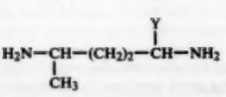
Albert Sjoerdsma, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 246,569, Mar. 23, 1981, Pat. No. 4,336,054, which is a continuation-in-part of Ser. No. 95,347, Nov. 19, 1979, abandoned. This application Apr. 15, 1982, Ser. No. 368,546

Int. Cl.³ A01N *33/04*

U.S. Cl. 71—67 **5 Claims**

1. A method of inhibiting the growth of algae which comprises contacting said algae with an algal inhibiting amount of an α-substituted amine having the formula



wherein

Y is selected from the group consisting of CH_2F, CHF_2 and C≡CH; and

the salts and individual optical isomers thereof.

4,437,874

TRI-MIXED ALKYLSULFONIUM SALTS OF N-PHOSPHONOMETHYLGLYCINE AND THEIR USE AS PLANT GROWTH REGULATORS AND HERBICIDES

George B. Large, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

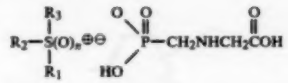
Continuation-in-part of Ser. No. 324,284, Nov. 25, 1981, Pat. No. 4,376,644, which is a continuation-in-part of Ser. No. 212,921, Dec. 4, 1980, Pat. No. 4,315,765. This application Jun. 21, 1982, Ser. No. 389,956

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ C07F 9/38; A01N 57/00

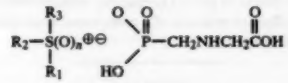
U.S. Cl. 71—87 39 Claims

1. A compound having the formula



where R_1, R_2, and R_3 represent C_1–C_{12} alkyl, and n is zero or one, wherein no more than two of R_1, R_2 or R_3 are identical.

19. A method of controlling undesirable vegetation comprising applying to the vegetative in post-emergent state an herbicidal composition comprising an herbicidally effective amount of a compound having the formula



where R_1, R_2, and R_3 represent C_1–C_6 alkyl, and n is zero or one, wherein no more than two of R_1, R_2 or R_3 are identical, and an inert diluent carrier.

4,437,875

2,4-DISUBSTITUTED-5-THIAZOLE-CARBOXYLIC ACIDS AND DERIVATIVES

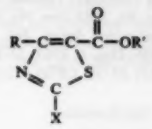
Robert K. Howe, Bridgeton, and Len F. Lee, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 140,335, Apr. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,959, Apr. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 906,183, May 15, 1978, Pat. No. 4,199,506. This application Apr. 22, 1981, Ser. No. 256,326

Int. Cl.³ A01N 43/02, 43/56, 37/18, 37/44

U.S. Cl. 71—90 24 Claims

1. A method for selectively preventing the growth of weeds in the presence of corn or sorghum crop plants which comprises applying to the crop plant locus an effective amount of acetamide herbicide selected from the group consisting of 2-chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide, 2-chloro-2',6'-diethyl-N-(butoxymethyl)acetanilide, N-(ethoxymeethyl)-N-(2-ethyl-6-methyl-1-cyclohexen-1-yl)-2-chloroacetamide,N-(ethoxymethyl)-N-(2,5-dimethyl-1-cyclopenten-1-yl)-2-chloroacetamide, 2-chloro-N-(ethoxymethyl)-6'-ethyl-o-acetotoluidide, the ethyl ester of N-chloroacetyl-N-(2,6-diethylphenyl)glycine, 2-chloro-2',3'-dimethyl-N-(isopropyl)acetanilide, 2-chloro-2',6'diethyl-N-(pyrazolylmethyl-)acetanilide, 2-chloro-6'-trifluoromethyl-N-(isopropoxymethyl)acetanilide, 2-chloro-2'methyl-6'-trifluoromethyl-N-(isopropoxymethyl)acetanilide, 2-chloro-2'-methyl-6'-methoxy-N-(isopropoxymethyl)acetanilide, 2-chloro-2'-methyl-6'-methoxy-N-(propoxymethyl)acetanilide, 2-chloro-2'-methyl-6'-ethoxy-N-(propoxymethyl)acetanilide and 2-chloro-2'-isobutoxy-6'-methyl-N-(propoxymethyl)acetanilide, 2-chloro-2'-isobutoxy-6'-ethyl-N-(ethoxymethyl)acetanilide and 2-chloro-2'-methyl-6'-trifluoromethyl-N-(ethoxymethyl)acetanilide, said crop plants having been germinated from seeds treated with a safening effective amount of a compound of the formula



wherein X is selected from the group consisting of chloro, bromo, iodo and fluoro, R is haloalkyl with up to 5 carbons, R' is selected from the group consisting of hydrogen, agriculturally acceptable cations, alkyl with up to 10 carbon atoms, lower alkenyl with up to 10 carbon atoms, lower alkynyl with up to 10 carbon atoms, alkoxyalkyl with up to 10 carbon atoms, haloalkyl and, with up to 10 carbon atoms phenyl.

4,437,876

2,4-DISUBSTITUTED-5-THIAZOLE-CARBOXYLIC ACIDS AND DERIVATIVES

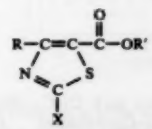
Robert K. Howe, Bridgeton, and Len F. Lee, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 140,335, Apr. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,959, Apr. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 906,183, May 15, 1978, Pat. No. 4,199,506. This application Apr. 22, 1981, Ser. No. 256,335

Int. Cl.³ A01N 43/02, 43/56, 37/18, 37/44

U.S. Cl. 71—90 22 Claims

1. A method for selectively preventing the growth of weeds in the presence of corn or sorghum crop plants which comprises applying to the crop plant locus an effective amount of herbicide selected from the group consisting of 2-chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide, 2-chloro-2',6'-diethyl-N-(butoxymethyl)acetanilide, N-(ethoxymethyl)-N-(2-ethyl-6-methyl-1-cyclohexen-1-yl)-2-chloroacetamide, N-(ethoxymethyl)-N-(2,5-dimethyl-1-cyclopenten-1-yl)-2-chloroacetamide, 2-chloro-N-(ethoxymethyl)-6'-ethyl-o-acetotoluidide, the ethyl ester of N-chloroacetyl-N-(2,6-diethylphenyl)glycine, 2-chloro-2',3'-dimethyl-N-(isopropyl)acetanilide, 2-chloro-2',6'diethyl-N-(pyrazolylmethyl)acetanilide, 2-chloro-6'-trifluoromethyl-N-(isopropoxymethyl)acetanilide, 2-chloro-2'-methyl-6'-trifluoromethyl-N-(isopropoxymethyl)acetanilide, 2-chloro-2'-methyl-6'-methoxy-N-(isopropoxymethyl)acetanilide, 2-chloro-2'-methyl-6'-methoxy-N-(propoxymethyl)acetanilide, 2-chloro-2'-methyl-6'-ethoxy-N-(propoxymethyl)acetanilide and 2-chloro-2'-isobutoxy-6'-methyl-N-(propoxymethyl)acetanilide, 2-chloro-2'isobutoxy-6'-ethyl-N-(ethoxymethyl)acetanilide and 2-chloro-2'-methyl-6'-trifluoromethyl-N-(ethoxymethyl)acetanilide, said crop plants having been germinated from seeds treated with a safening effective amount of a compound of the formula



wherein X is selected from the group consisting of chloro, bromo, iodo and fluoro, R is haloalkyl with up to 5 carbons and R' is benzyl.

4,437,877

2-(2-FLUORO-4-HALO-5-SUBSTITUTED PHENYL) HYDANTOINS AND USE

Eiki Nagano, Nishinomiya; Shunichi Hashimoto, Toyonaka; Ryo Yoshida, Kawanishi; Hiroshi Matsumoto, Toyonaka, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

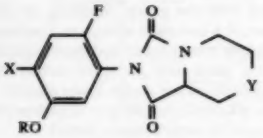
Filed Jun. 10, 1982, Ser. No. 387,275

Claims priority, application Japan, Jun. 16, 1981, 56-93315; Dec. 4, 1981, 56-196035; Dec. 4, 1981, 56-19036

Int. Cl.³ A01N *43/90*; C07D *471/04, 513/04*

U.S. Cl. 71—90 18 Claims

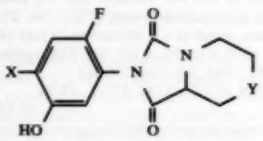
1. A compound of the formula:



wherein X is a chlorine atom or a bromine atom, Y is —CH_2—, —S— or —SO_2— and R is a C_1–C_4 alkyl group, an allyl group or a propargyl group.

17. A method for controlling weeds which comprises applying a herbicidally effective amount of the compound according to claim 1 to the area where the weeds grow or will grow.

18. A compound of the formula:



wherein X is a chlorine atom or a bromine atom and Y is —CH_2—, —S— or —SO_2—.

4,437,878

DIHYDROTHIOPHENECARBOXYLATES AND THEIR USE FOR CONTROLLING UNDERSIRABLE PLANT GROWTH

Rolf-Dieter Acker, Leimen; Phillip A. Rossy, Ludwigshafen; Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

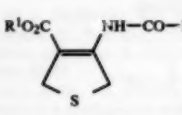
Filed Mar. 31, 1983, Ser. No. 480,895

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211851

Int. Cl.³ A01N *43/02*; C07D *333/24*

U.S. Cl. 71—90 8 Claims

1. A dihydrothiophenecarboxylate of the formula



(I)

where R^1 and R^2 are each C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_1–C_{10}-haloalkyl, C_2–C_{10}-alkoxyalkyl, C_2–C_{10}-alkylthioalkyl or C_3–C_7-cycloalkyl, or are each phenyl which is unsubstituted or substituted by halogen or C_1–C_4-alkyl, or are each unsubstituted or halogen-substituted benzyl, and R^1 may furthermore be hydrogen.

4,437,879

OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Werner Föry, Basel; Henry Martin, Allschwil, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 68,263, Aug. 20, 1979, Pat. No. 4,353,935.

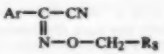
This application Jul. 14, 1982, Ser. No. 398,164

Claims priority, application Switzerland, Aug. 31, 1978, 9201/78

Int. Cl.³ A01N *43/38*; C07D *209/48*

U.S. Cl. 71—96 5 Claims

1. A compound of the formula



wherein

Ar is 1-naphthyl or

in which

R_1 is hydrogen, lower alkyl, lower alkoxy or halogen, and

R_2 is hydrogen or lower alkyl, and

R_8 is phthalimido or tetrahydrophthalimido.

5. An antidote composition for use in safening plants against the harmful effects of potent herbicides which comprises (1) an antidotally effective amount of a compound according to claim 1 and (2) a carrier.

4,437,880

N'-PHENYL-N-METHYLUREA DERIVATIVES

Junya Takahashi, Nishinomiya; Ichiki Takemoto, Takarazuka; Katsuzo Kamoshita, Osaka; Ryo Yoshida, Kawanishi; Haruhiko Katoh, and Seizo Sumida, both of Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

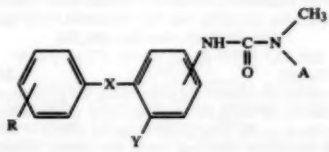
Filed May 28, 1981, Ser. No. 269,851

Claims priority, application Japan, May 28, 1980, 55-71938

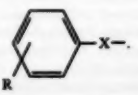
Int. Cl.³ A01N *47/30*; C07C *127/19*

U.S. Cl. 71—120 8 Claims

1. A compound of the formula:



wherein R is a hydrogen atom or a C_1–C_4 alkyl group, X is a C_3–C_4 alkylene group or a C_3 alkenylene group, Y is a hydrogen atom or a chlorine atom, A is a methyl group or a methoxy group and the substituted ureido group is present at the m- or p-position to the group of the formula:



7. A method for controlling or exterminating weeds which

comprises applying a herbicidally effective amount of at least one of the compounds according to claim 1 to the area where the weeds grow or will grow.

4,437,881

ACICULAR FERROMAGNETIC ALLOY PARTICLES AND PROCESS FOR PRODUCING SAID PARTICLES

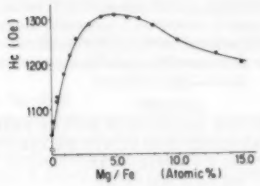
Akio Mishima; Yoshiro Okuda; Tosiharu Harada; Akira Mukaizaka, and Tomoyuki Imai, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Japan

Filed Jul. 14, 1983, Ser. No. 513,866

Claims priority, application Japan, Jul. 31, 1982, 57-134016; Aug. 30, 1982, 56-151467

Int. Cl.³ B22F 9/22

U.S. Cl. 75—0.5 AA 15 Claims



1. Acicular ferromagnetic alloy particles doped with silicon, chromium and nickel.

4,437,882

FERROMAGNETIC POWDER TREATED WITH AN ORGANIC SILANE COMPOUND

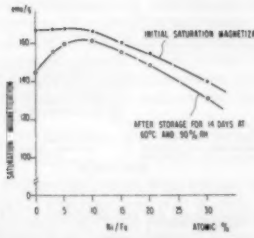
Shizuo Umemura; Akihiro Matsufuji; Masashi Aonuma; Tatsuji Kitamoto, and Hajime Miyatsuka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 26, 1983, Ser. No. 517,304

Claims priority, application Japan, Jul. 26, 1982, 57-129024

Int. Cl.³ B22F 9/22

U.S. Cl. 75—0.5 R 17 Claims



9. A process for producing a ferromagnetic metal powder, comprising the steps of:

reducing an iron compound selected from the group consisting of nickel-doped iron oxyhydroxide, nickel-coated iron oxyhydroxide, nickel-doped iron oxide and nickel-coated iron oxide in a reducing gas, to provide a reduced metal powder including nickel in an amount of 3 to 30 atomic % based on the atomic % of iron present in the reduced metal powder; and

treating the reduced metal powder with an organic silane compound to provide a silane-treated powder.

4,437,883

PROCESS FOR PRODUCING METAL POWDER

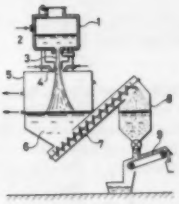
Toshihiko Kubo, Namekata; Minoru Ichidate, Otsu; Toshiyuki Kawai, Nishinomiya; Sadao Yonehara, Katano; Yoshihisa Koiwai, and Kazuhiko Endo, both of Yokohama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Nippon Oil Co. Ltd., Tokyo, both of, Japan

Filed Feb. 14, 1983, Ser. No. 466,317

Claims priority, application Japan, Feb. 12, 1982, 57-21818

Int. Cl.³ B22F 9/08

U.S. Cl. 75—0.5 C 8 Claims



1. A process for producing metal powder by impinging an atomizing medium against a molten metal in a state isolated from the ambient air, said atomising medium consist essentially of an alcohol having 1–4 carbon atoms and water and the weight ratio of said alcohol to water is within the range of 2–70:98–30.

4,437,884

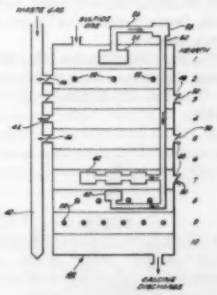
ORE ROASTING WITH RECYCLE OF GASES

Raymond Hawryluk, Upper St. Clair; Clyde R. Johnson, Claysville, both of Pa., and N. Henri Masarky, Tenafly, N.J., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 205,788, Nov. 10, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,779

Int. Cl.³ C22B 1/02; C01G 39/00

U.S. Cl. 75—7 13 Claims

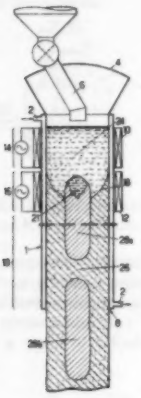


1. A process for reducing organic matter emissions during the oxidative roasting of metal sulfides in a furnace which is heated by fuel burners, and which has a plurality of hearths in a vertical configuration, wherein at least a portion of higher-temperature gases formed during the oxidation is recycled to a lower-temperature, lower portion of the furnace.

4,437,885
METHOD FOR THE PHYSICAL SEPARATION OF A METALLIC PHASE AND SCORIAE IN AN INDUCTION FURNACE

Georges Bolze, Paris, France, assignor to Compagnie Generale des Matieres Nucleaires (Cogema), Velizy Villacoublay, France

Filed Aug. 31, 1982, Ser. No. 413,457
Claims priority, application France, Sep. 3, 1981, 81 16783
Int. Cl.³ C22C *4/00*
U.S. Cl. 75—10 R **18 Claims**



1. Method for the separation in an induction furnace of a metallic phase and scoriae contained in a crucible essentially transparent to an electromagnetic field maintained within said induction furnace, which comprises subjecting the materials:

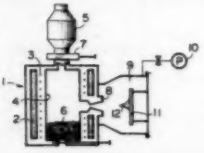
in a first zone to an induction current of sufficiently high power and frequency to permit the direct coupling of this induction current with the materials in this first zone, so as to maintain the scoriae in the molten state,

then, in a second zone, adjacent to the preceding one, to an induction current of such power or frequency, or both, that direct coupling between the induction current and the scoriae is no longer permitted.

4,437,886
PROCESS FOR MANUFACTURE OF METALLIC MAGNESIUM

Hirohisa Miura, Okazaki; Hiroshi Satou, and Toshio Natsume, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 29, 1982, Ser. No. 373,267
Claims priority, application Japan, May 6, 1981, 56-68025
Int. Cl.³ C22B *26/22*
U.S. Cl. 75—67 R **8 Claims**



1. A process for manufacture of metallic magnesium, comprising the steps, performed in the specified order, of:

(a) mixing together:

(a1) a first quantity of magnesium oxide;

(a2) a second quantity of a carbide forming material which is either a material selected from the group of materials consisting of calcium, aluminum, boron, silicon, calcium oxide, aluminum oxide, boron oxide, and silicon oxide, or is a mixture of two or more of these materials; the weight of said second quantity being 10% or less than the weight of said first quantity; and

(a3) a third quantity of carbon, said third quantity being at least the equivalent mol weight of said first quantity of magnesium oxide plus said second quantity of carbide forming material;

then

(b) heating the resultant mixture within a reducing furnace at a pressure between about 5 and 200 torr and at a temperature of at least 1600° C., so as to effect a first reaction to generate carbide from the selected carbide forming material and the carbon, and a second reaction to reduce the magnesium oxide by the carbide thereby generating magnesium vapor while regenerating the carbide forming material;

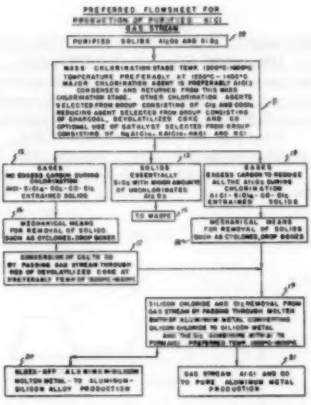
and then

(c) cooling the magnesium vapor rapidly by adiabatic expansion thereof so as to generate metallic magnesium.

4,437,887
PRODUCTION OF ALUMINUM METAL FROM ALUMINA BAUXITES AND CLAYS BY FIRSTLY PRODUCING A PURIFIED ALUMINUM MONOCHLORIDE

David Weston, 34 Parkwood Ave., Toronto, Ontario, Canada (M4V 2X1)

Continuation-in-part of Ser. No. 253,639, Apr. 13, 1981. This application Sep. 29, 1982, Ser. No. 426,971
Int. Cl.³ C22B *21/02*
U.S. Cl. 75—68 B **10 Claims**



1. The process steps for the production of aluminum metal from the group of materials consisting of alumina, bauxites and clays and said materials containing at least Al_2O_3 minerals in the group consisting of $Al_2O_3xH_2O$ and $Al_2O_3.2SiO_2\ 2H_2O$ and free moisture and said Al_2O_3 minerals containing chemically combined H_2O comprising: subjecting the said materials to calcination in the temperature range of about 625° C. to 1500° C. to produce a calcined product substantially free of said chemically combined H_2O and said free moisture; subsequently subjecting the said calcined product to at least a mass chlorination stage in the presence of chlorination agent selected from the group consisting of Cl_2, $COCl_2$, and $AlCl_3$ and reducing agent selected from the group consisting of C and CO and in the temperature range of about 1200° C. to 1600° C. to

produce a gas stream wherein the said Al_2O_3 has been converted to gaseous AlCl and said gas stream contains said AlCl, and at least CO_2 and Cl_2; subsequently passing the said gas stream through at least one bed selected from the group consisting of charcoal and devolatilized coke and in the temperature range of about 1200° C. to 1600° C. to convert said CO_2 to CO to produce a first modified gas stream containing at least said AlCl and Cl_2, and said CO; subsequently passing the said first modified gas stream through molten aluminum metal in the temperature range of about 1200° C. to 1600° C. to convert the said Cl_2 to AlCl to produce a second modified gas stream containing at least the said AlCl and CO; subsequently lowering the temperature of the said second modified gas stream to within the temperature rang of about 670° C. to 1050° C. to produce molten aluminum metal and a third modified gas stream containing $AlCl_3$ and said CO.

4,437,888

PREPARATION OF TITANIUM/ALUMINUM ALLOYS

Gilbert Jecker, Schiltigheim, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 5, 1982, Ser. No. 375,099

Claims priority, application France, May 6, 1981, 81 08975

Int. Cl.³ C22C *14/00*

U.S. Cl. 75—84.4 **28 Claims**

1. A process for the production of an admixture of metals in metallic state and a cryolite mineral comprising (1) reducing an alkali metal fluotitanate with aluminum at an elevated temperature which is below that at which vaporization of products of said reduction occurs, said reduction occurring in the presence of an alkali metal oxide reactive flux, (2) solubilizing with water fluorine compounds formed during said reduction which are in admixture with a dispersion of metallic titanium and aluminum also formed during said reduction, (3) separating said titanium and aluminum from said aqueous solution of solubilization of step (2), (4) contacting said aqueous solution of solubilization from which said metallic titanium and aluminum have been separated with a mineral acid to form a cryolite mineral, and (5) recovering said cryolite mineral.

16. A process for the production of an admixture of metals in metallic state and a cryolite mineral comprising (1) coreducing an admixture of an alkali metal fluotitanate, aluminum and at least one halide of a metal M wherein M is selected from the group consisting of vanadium, zirconium, chromium, niobium, tantalum and iron at an elevated temperature which is below that at which vaporization of products of said coreduction occurs, said coreduction occurring in the presence of an alkali metal oxide reactive flux, (2) solubilizing with water fluorine compounds formed during said reduction which are in admixture with a dispersion of metals in metallic state also formed during said reduction, (3) separating said metals in metallic state from said aqueous solution of solubilization of step (2), (4) contacting said aqueous solution of solubilization from which said metallic titanium and aluminum have been separated with a mineral acid to form a cryolite mineral, and (5) recovering said cryolite mineral.

4,437,889

METHOD OF RECOVERING SILVER FROM SOLID AND LIQUID PHOTOGRAPHIC WASTE

Eliodoro Palacios-Mendoza, Calle Centro. Santa Sofia QTA. Gimereli, Caracas, Venezuela (1060)

Continuation of Ser. No. 290,694, Aug. 6, 1981, abandoned. This application Jul. 15, 1983, Ser. No. 514,351

Int. Cl.³ C22B *11/00*

U.S. Cl. 75—118 P **4 Claims**

1. A method of recovering silver from a silver-containing photographic liquid fixer waste, comprising:

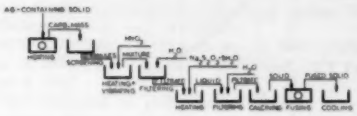
(a) heating the silver-containing photographic liquid fixer waste to a temperature between about 45° C. and 65° C.;

(b) mixing under agitation said heated silver-containing photographic liquid waste with aqueous nitric acid at a 65% concentration and having a specific density of 1.40 grams per ml at a ratio of at most eight parts of nitric acid to one part of said photographic liquid waste;

(c) digesting said mixture during a period between 0.7 and 1.5 hours at a temperature between 55° C. and 65° C.;

(d) filtering through a porous ceramic filter the digested mixture and washing the filtrate at room temperature;

(e) the filtered residue is collected in a ceramic dish and heated therein to a temperature of about 65° C. for about 0.5 hours;



(f) subjecting the heated filtered residue to a further heating stage in a temperature ranging between about 600° C. and 700° C. until said residue turns into a gray solid;

(g) fusing at a graphite crucible said gray solid during between about 0.4 and 0.6 hours in a temperature between about 900° C. and 1000° C.; and

(h) dumping the fused product directly from the graphite crucible into water at room temperature to solidify it, obtaining a 99.5% purity silver.

4,437,890

METHOD OF THE PREPARATION OF HIGH DENSITY SINTERED ALLOYS BASED ON IRON AND COPPER

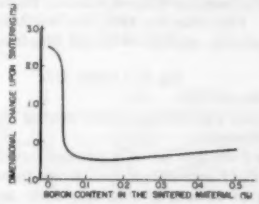
Tadao Hayasaka, Chiba; Masahiro Suzuki, Adachi; Shigeru Ozawa, Tokiwadaira, and Yoshiaki Takeya, Matsuhidai, all of Japan, assignors to Hitachi Powdered Metals Co., Ltd., Japan

Continuation of Ser. No. 170,991, Jul. 18, 1980, abandoned. This application Mar. 21, 1983, Ser. No. 477,365

Claims priority, application Japan, Jul. 28, 1979, 54-096389

Int. Cl.³ B22F *3/00*

U.S. Cl. 75—244 **26 Claims**



1. Method of preparing a high density iron and copper based sintered alloy from alloy material composed mainly of iron and by weight up to 50% copper, 0–0.5% carbon, 0–3% nickel, and 0–1.5% molybdenum in which boron is added to the alloy material in an amount of no less than 0.03% and sufficient to suppress or limit the copper growth phenomenon of the copper present during sintering, and then sintering the alloy material.

4,437,891

OIL-ATOMIZED LOW-ALLOY STEEL POWDER

Masahide Umino, Nara; Eijiro Tamura, Hirakata; Isamu Karasuno, Yamato-Kooriyama; Minoru Ichidate, Ohtsu, and Toshihiko Kubo, Chiba, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Feb. 22, 1982, Ser. No. 350,565

Claims priority, application Japan, Feb. 24, 1981, 56-26476

Int. Cl.³ B22F *1/00*; C22C *38/12, 38/22*

U.S. Cl. 75—251 **10 Claims**

1. An oil-atomized low-alloy steel powder having improved

compressibility, compactibility and hardenability, the chemical composition of which after decarburization is:

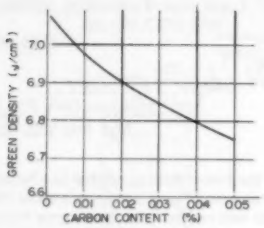
C: no greater than 0.02%,

Mn: 0.3–2.0%,

Oxygen: no greater than 0.10%,

one or more of

Cr: 0.1–2.0%, Mo: 0.05–1.0%,



Ni: 0.1–2.0%, Cu: 0.2–2.0%,

V: 0.03–0.5% and Nb: 0.05–0.5%,

the balance substantially iron,

the powder having a green density of 6.9 g/cm^3 or more and a Rattler value of 1.0% or less when the powder is mixed with 0.8% of zinc stearate as a lubricant and then is compacted at a pressure of 5 ton/cm^2.

4,437,892

MARINE ANTIFOULING COATING COMPOSITION

Jeffrey R. Kelsey, Ashford, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 23, 1981, Ser. No. 246,384

Claims priority, application United Kingdom, Mar. 27, 1980, 8010350

Int. Cl.^{3} C09D *5/14*

U.S. Cl. 106—15.05 **8 Claims**

1. A marine anti-fouling surface coating composition comprising components

(1) from 5 to 55% wt of a polymer having 1 to 50% by weight of functional groups selected from the group consisting of carboxylic acid, anhydride and acid chloride groups capable of reacting with amine groups to form a three dimensional polymer network,

(2) from 2 to 10% wt of a hydrocarbyl polyisocyanate which is not, in itself, a cross-linking agent for the polymer of (1) above, wherein the hydrocarbyl group has from one to ten carbon atoms,

(3) from 5 to 35% wt of a hydrocarbyl tin compound having the formula R_3SnX wherein R is the hydrocarbyl group having from one to ten carbon atoms and X is oxygen or sulfur,

(4) from 0 to 20% wt of an epoxy compound, and

(5) from 0 to 80% wt of a pigment, wherein components (1), (2) and (3) interact in use according to the following sequence of reactions

(a) the hydrocarbyl polyisocyanate and the hydrocarbyl tin compound react to form a carbamate or thiocarbamate,

(b) the carbamate or thiocarbamate hydrolyses to an amine and the original hydrocarbyl tin compound, and

(c) the amine and the polymer having functional groups react to give a surface coating.

4,437,893

USE OF SOY POLYSACCHARIDES AS A THICKENING AGENT FOR ALKALI SILICATE ADHESIVES

Thomas L. Krinski, Granite City, Ill., and Charles E. Coco, Saint Louis, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Feb. 28, 1983, Ser. No. 470,408

Int. Cl.^{3} C04B *19/04*

U.S. Cl. 106—80 **26 Claims**

1. A silicate containing adhesive composition comprising an aqueous solution of an alkali metal silicate containing a soy polysaccharide material in an amount effective to thicken said solution and improve the adhesive properties thereof.

4,437,894

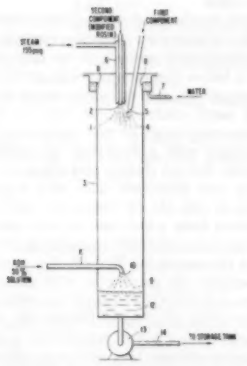
SIZING COMPOSITIONS CONTAINING A FORMIC ACID SALT, PROCESSES, AND PAPER SIZED WIH THE COMPOSITIONS

Ralph W. Emerson, Sr., Boston, Mass., assignor to The Plasmine Corporation, Portland, Me.

Filed Nov. 17, 1982, Ser. No. 442,319

Int. Cl.^{3} C08L *93/04*

U.S. Cl. 106—238 **39 Claims**



1. A sizing composition which comprises sizing -effective amounts of a rosin that is modified with from about 5 to 50 percent, based on the weight of the rosin, of an organic acidic compound selected from the group consisting of an alpha, beta-unsaturated aliphatic acid containing from about 3 to 6 carbon atoms, an anhydride thereof, and their mixtures; ammonia in amounts sufficient to enhance the sizing characteristics of the composition; ammonium formate effective to, and in amounts sufficient to, enhance the sizing characteristics of the composition; and containing amounts of the modified rosin, ammonia and ammonium formate sufficient to provide the composition with a total acidity of at least about 1,000 parts per million.

4,437,895

MIXTURE OF VEGETABLE OILS BASED ON JOJOBA OIL AND COSMETIC COMPOSITIONS COMPRISING THE MIXTURE

Constantin Koulbanis, Paris; Quang L. N'Guyen, Antony; Arlette Zabotto, Paris, and Josiane Plot, Aulnay-sous-Bois, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Jul. 20, 1982, Ser. No. 400,221

Claims priority, application France, Jul. 23, 1981, 8114366

Int. Cl.^{3} C08L *91/00*; C09D *3/26*; A61K *7/48*

U.S. Cl. 106—245 **10 Claims**

1. An oxidation stable mixture comprising 5–95 percent by weight of jojoba oil, the remainder being a member selected

from the group consisting of hazelnut oil, mango oil, coffee bean wax, karite butter, soya oil, palm oil, maize germ oil and mixtures thereof.

4,437,896

SYNTHETIC ASPHALT MIXTURES AND PROCESSES FOR MAKING THEM

John F. Partanen, 612 W. Kiva Ave., Mesa, Ariz. 85202

Continuation-in-part of Ser. No. 432,091, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 268,363, May 29, 1981, abandoned. This application Feb. 8, 1983, Ser. No. 465,013

Int. Cl.³ C08L 95/00

U.S. Cl. 106—273 R 20 Claims

1. A synthetic asphalt composition, consisting of a mixture of gilsonite and a tall oil product.

5. A modified synthetic asphalt composition consisting of a mixture of gilsonite, a tall oil product, and additive material for modifying the composition to provide desired properties selected from the group consisting of aggregate, petroleum asphalt, and reclaimed rubber.

4,437,897

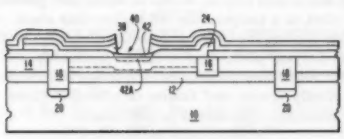
FABRICATION PROCESS FOR A SHALLOW EMITTER/BASE TRANSISTOR USING SAME POLYCRYSTALLINE LAYER

Bernard M. Kemlage, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1982, Ser. No. 379,535

Int. Cl.³ H01L 21/425, 21/265, 21/225

U.S. Cl. 148—1.5 9 Claims



1. A process for forming a transistor having a shallow emitter region and a narrow intrinsic base region and an extrinsic base region using the same polycrystalline silicon layer comprising the steps of

depositing a layer of polycrystalline silicon on a semiconductor substrate provided with a subcollector, epitaxy, isolated regions, and oxide surface with holes open in the oxide surface for the extrinsic base, intrinsic base and emitter region,

thermally oxidizing the surface of the polycrystalline silicon layer,

implanting the base impurity into the polycrystalline silicon layer,

defining and removing the surface oxide layer and the polycrystalline silicon layer from the subcollector reach-through area,

depositing a silicon nitride layer,

depositing a silicon dioxide layer,

opening the silicon dioxide layer the silicon nitride layer and the thermal oxide layer to define the intrinsic base and the emitter area,

thermally oxidizing the polycrystalline layer and driving the base impurity downwardly into the epitaxial layer to form the extrinsic base region and the intrinsic base region,

etching the thermal oxide in the emitter area in an isotropic etch,

ion implanting the emitter impurity into the emitter area of the polycrystalline silicon layer,

thermally oxidizing to drive the emitter impurity inwardly into the epitaxial layer to form the emitter region, and

opening the collector, extrinsic base and emitter contact openings and forming the conductive metallurgy.

4,437,898

METHOD AND AGENT FOR PASSIVATING IRON AND STEEL SURFACES

Hermann Drosdziok; Jürgen Geke, both of Dusseldorf, and Hans G. Germscheid, Ratingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP81/00128, § 371 Date Apr. 5, 1982, § 102(e) Date Apr. 5, 1982, PCT Pub. No. WO82/00665, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 19, 1981, Ser. No. 369,022

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032226

Int. Cl.³ C23F 7/08

U.S. Cl. 148—6.15 R 14 Claims

1. Method for passivating iron and steel surfaces with the aid of aqueous, alkaline reacting solutions which contain corrosion inhibitors, consisting essentially in that the metal surface is treated with solutions which contain from 0.5% to 5% by weight of a combination, giving a clear solution in water, of

(a) one or more maleic acid monoalkylamides having from 6 to 14 carbon atoms in said monoalkyl,

(b) one or more alkanolamines having from 2 to 12 carbon atoms,

(c) one or more phosphonic acids which have complexing properties, the weight ratio of maleic acid monoalkylamide to alkanolamine being 1:0.3 to 1:10 and the weight ratio maleic acid monoalkylamide to phosphonic acid being 1:0.01 to 1:0.5 and the pH value of the solution being between 7.5 and 10.5.

4,437,899

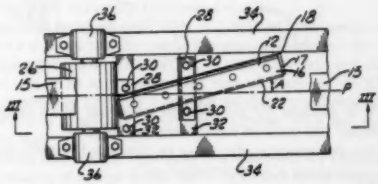
METAL BILLET CUTTING APPARATUS AND METHOD

Joseph Rokop, Pittsburgh, and Nikolaus Rokop, Bridgeville, both of Pa., assignors to Rokop Corporation, Pittsburgh, Pa.

Filed Jul. 25, 1983, Ser. No. 516,907

Int. Cl.³ B23K 7/02

U.S. Cl. 148—9 R 11 Claims



1. In a metal processing apparatus wherein an elongated stand of metal is severed as it moves along a pass line by cutting means which is operative to cut the strand transversely of said pass line into billets of a given length, the improvement comprising:

a material removing means located at a fixed position with respect to the longitudinal extent of said pass line and operable to engage an exterior surface of said strand of metal moving on said pass line along at least one continuous line of action extending throughout the lateral extent of said exterior surface for removing material from said exterior surface as said strand moves along said pass line in a manner that the material removal effected by said material removing means at the location of any such transverse severing progresses transversely of said exterior surface from one lateral side of said strand to the other lateral side thereof as said strand moves along said pass line.

4,437,900

THERMAL MECHANICAL TREATMENT FOR ENHANCING HIGH TEMPERATURE PROPERTIES OF CAST AUSTENITIC STEEL STRUCTURES

Ruzica Petkovic-Luton, Englewood, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 334,651, Dec. 28, 1981, abandoned.
This application Jan. 5, 1983, Ser. No. 455,881
Int. Cl.³ C21D 7/14
U.S. Cl. 148—12 E 10 Claims

1. A method for improving the high temperature properties of cast austenitic steel structures, the method comprising:

(a) heating the structures to at least the temperature at which chromium carbides go into solution, but below the temperature where incipient melting occurs;

(b) maintaining the structures at such temperature for an effective amount of time;

(c) hot working the structures by applying from about 15% to 60% plastic deformation; and

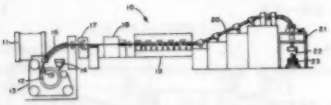
(d) cooling the structures at a rate less than about 100° C./hr to allow recrystallization of the grains to occur such that the resulting average grain size is from about 45 μm to about 180 μm.

4,437,901

METHOD AND APPARATUS FOR IMPROVED HEAT TREATMENT OF ALUMINUM ALLOY ROD

Bobby C. Gentry, Temple, Ga., assignor to Southwire Company, Ga.

Filed Dec. 21, 1981, Ser. No. 332,988
Int. Cl.³ C21D 1/00, 9/62
U.S. Cl. 148—11.5 A 13 Claims



7. A method for the thermal treatment of an intermediate metallic rod product comprising the steps of:

(a) continuously advancing an elongated metallic rod product along a predetermined path,

(b) passing an electrical current through said elongated rod product to elevate the temperature thereof to a predetermined solution heat treating temperature in a first heating zone,

(c) continuously advancing the elongated metallic rod product through a second heating zone and heating the rod product therein by thermostatically controlled radiant heaters and accumulating an extended length of the metallic rod product therein in multiple wraps only partially around a pair of rotatable cylinders within the second heating zone and having parallel axes in a horizontal plane,

(d) maintaining the continuously advancing elongated metallic rod product within the second heating zone until solutionizing is completed,

(e) continuously advancing the elongated metallic rod product through a cooling zone, and

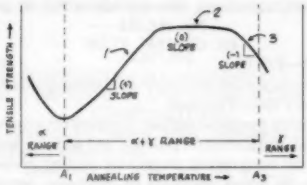
(f) cooling the continuously advancing elongated metallic rod product to room temperature after solutionizing is completed.

4,437,902

BATCH-ANNEALED DUAL-PHASE STEEL

John W. Pickens, Strongsville; John K. Abraham, Broadview Heights; Raymond E. Mintus, Warren, and Millicent H. Thomas, Broadview Heights, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Oct. 19, 1981, Ser. No. 312,510
Int. Cl.³ C21D 8/10
U.S. Cl. 148—12 F 11 Claims



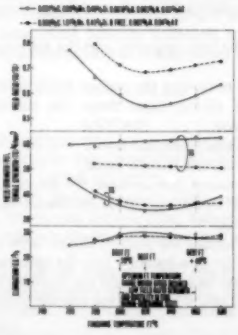
1. A method of making a dual-phase rolled steel product which has ultimate tensile strength of at least 80 ksi, yield/ultimate tensile ratio not higher than about 0.65 and at least about 18% total elongation, comprising: establishing steel in ingot form having a composition consisting essentially of 0.03 to 0.2% carbon, 0.65 to 2.0% manganese, 0 to 0.75% silicon, 0.4 to 1.5% copper, 0.6 to 1.5% nickel, 0 to 1% molybdenum, 0 to 0.15% tungsten, 0 to 0.1% aluminum, balance iron and incidental elements, subjecting said steel to rolling, including hot rolling, to convert said steel to tightly coiled, rolled strip, batch annealing said coiled strip in an enclosed region, by heating said coiled strip to within an alpha plus gamma region of said steel, at a temperature not higher than about 1400° F., thereafter cooling the coiled strip within the range of about 25° to 100° F. per hour, and thereby producing the above-described rolled steel product, which comprises a matrix phase that is chiefly ferrite, and bodies of a second phase that are chiefly martensite distributed in said matrix.

4,437,903

METHOD FOR PRODUCING TWO-PHASE HOT ROLLED STEEL SHEET HAVING HIGH STRENGTH AND LOW YIELD RATIO

Takashi Furukawa, and Michio Endo, both of Kanagawa, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,145
Claims priority, application Japan, Jan. 28, 1982, 57-12277
Int. Cl.³ C21D 8/04
U.S. Cl. 148—12 F 5 Claims



1. A method for producing high-strength, low yield ratio two-phase hot rolled steel sheets having a tensile strength of at least about 52 kg/mm² which comprises:

hot rolling a steel composition comprising:

0.03%–0.12% C
0.7%–1.0% Mn
0.01%–0.9% Si
0.01%–0.1% Al
0.0005%–0.005% B
less than 0.006% N and which is about equal to the B content

with a finishing temperature FT as defined by the formula:

$$FT\,(°C.) = 953 - 400 \times (C\,\%) - 133 \times (Mn\,\%) + 40 \times (Si\,\%) \begin{matrix}+40\\-20\end{matrix}$$

(by weight %)

cooling the hot rolled sheet thus obtained to a temperature not higher than 300° C. with an average cooling rate of 20° to 200° C./second and coiling the steel sheet thus cooled.

4,437,904

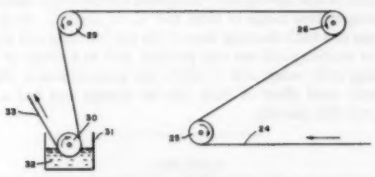
METHOD FOR IMPROVED HEAT TREATMENT OF ELONGATED ALUMINUM ALLOY MATERIALS

Joseph MacCraven, Bremen, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 332,992, Dec. 21, 1981. This application Aug. 16, 1982, Ser. No. 408,380

Int. Cl.³ C21D *1/40*

U.S. Cl. 148—13.1 **21 Claims**



1. A method of heat treating aluminum wire material after cross section reduction thereof, comprising the steps of:

(a) continuously advancing an elongated aluminum wire material along a predetermined path,

(b) passing an electrical current through said elongated aluminum wire material sufficient to heat said elongated aluminum wire material to a temperature of at least 650 degrees F. and within the annealing temperature range of the aluminum wire in a first heating zone,

(c) continuously advancing the elongated aluminum wire material through a second, adjustable heating zone having a temperature of at least 650 degrees F. and below 850 degrees F., and controlling the second, adjustable heating means to rapidly change the temperature of the wire from the first zone so as to complete annealing of the wire during a brief residency period thereof within the second heating zone,

(d) continuously advancing the elongated aluminum wire material through at least one cooling zone.

4,437,905

PROCESS FOR CONTINUOUSLY ANNEALING A COLD-ROLLED LOW CARBON STEEL STRIP

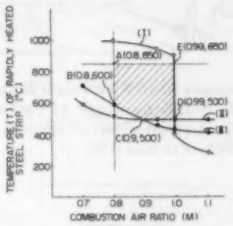
Hajime Nitto, and Hiromitsu Naitoh, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 139,275, Apr. 10, 1980, abandoned. This application Jan. 13, 1982, Ser. No. 339,053

Claims priority, application Japan, Dec. 5, 1979, 54-156844; Dec. 5, 1979, 54-156845

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—16 **11 Claims**



1. A process for continuously annealing a cold-rolled low carbon steel strip, comprising the continuous steps of:

introducing a cold-rolled low carbon steel strip into a direct fired furnace, in which a fuel is burnt in a combustion air ratio of 0.8 or more, but less than 1.0 to produce a gaseous combustion product, and in which furnace said steel strip is heated in said gaseous combustion product atmosphere at an average heating rate of from 30° to 100° C./second in the temperature range of from 500° C. to the Ac_3 point of said steel strip, whereby a layer of oxides is formed on the surface of said steel strip, said oxides having a thickness limited to 1,000 angstroms or less;

introducing said heated steel strip into a reducing atmosphere which consists essentially of a mixture of 4% or more of hydrogen gas and the balance consisting of nitrogen gas and which has a dew point of 10° C. or less and in which atmosphere the temperature of said steel strip is maintained in the range of from 700° C. to the Ac_3 point of said steel strip for 10 seconds or more, whereby said layer of oxides is reduced;

cooling said reduced steel strip to a desired temperature in such a manner that the cooling operation is started from a temperature of at least 600° C. of said steel strip and carried out at an average cooling rate of from 10° to 300° C./second by bringing a cooling medium, consisting of a mixture of a gas and a liquid, into contact with said steel strip; and

subjecting said cooled steel strip to a treatment for eliminating a layer of oxides which has been formed on the surface of said steel strip during said cooling operation;

wherein said air combustion ratio refers to the ratio of the amount of air in volume supplied to combust a predetermined amount of fuel to the amount of air in volume stoichiometrically necessary for completely burning the predetermined amount of fuel.

4,437,906

FLUX COMPOSITION FOR ELECTRO-SLAG OVER-LAY WELDING OF A CYLINDRICAL VESSEL WITH A STRIP ELECTRODE

Junji Tateishi, Chiba; Takeharu Ishikawa, Ichihara; Shozaburo Nakano, Mobara, and Noboru Nishiyama, Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 14, 1983, Ser. No. 475,362

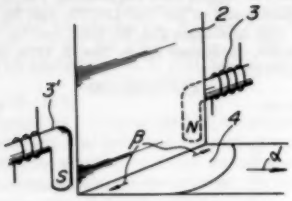
Claims priority, application Japan, Mar. 26, 1982, 57-47302

Int. Cl.³ B23K *35/34*

U.S. Cl. 148—26 **2 Claims**

1. A flux composition for horizontal electro-slag over-lay

welding a stainless steel on a circumferential inner surface of a cylindrical vessel with a strip electrode under controlling a flow of molten slag and metal with an outer electro-magnetic



field, which contains 50–60% by weight of CaF_2, 10–20% by weight of SiO_2, 5–25% by weight of CaO and 10–30% by weight of Al_2O_3 in a ratio of SiO_2/CaF_2 of at least 0.20 and a ratio of CaO/SiO_2 of at least 0.50.

4,437,907

AMORPHOUS ALLOY FOR USE AS A CORE

Takashi Sato, and Tsutomu Ozawa, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,241

Claims priority, application Japan, Mar. 6, 1981, 56-32345

Int. Cl.³ H01F 1/04

U.S. Cl. 148—31.55 **17 Claims**

1. An annealed amorphous alloy for use as the core of electric-power transforming machines and devices, wherein said annealed alloy has an essentially amorphous structure, an extremely low watt loss, a high thermal stability in respect to the magnetic properties and amorphous structure, a small change in the magnetic properties depending upon the temperature, and exhibits a very low increase in watt loss and a very low decrease in magnetic flux density after aging, and is composed of the chemical formula of $Fe_aSi_bB_cC_d$, said parameters a, b, c, and d being the following atomic percentages:

a=from 74 to 79%

b=from 10 to 19%

c=from 6 to 13%

d=from 0 to 3.5%

with the proviso that a+b+c+d=100%;

wherein the decrease in magnetic flux density after annealing in terms of:

$$\frac{B_1 \text{ after said aging} - B_1 \text{ before said aging}}{B_1 \text{ before said aging}} \times 100(\%)$$

does not exceed 3%, and,

wherein said alloy is annealed at a temperature of from 350° to 430° C. in a magnetic field higher than the coercive force of said alloy.

4,437,908

METHOD OF TREATING A MAGNETIC MATERIAL

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

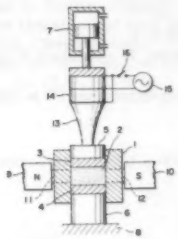
Filed Oct. 10, 1980, Ser. No. 195,928

Claims priority, application Japan, Oct. 13, 1979, 54-132130; Oct. 13, 1979, 54-132131

Int. Cl.³ C21D 1/04

U.S. Cl. 148—108 **21 Claims**

1. A method of treating a preshaped magnetic material in the manner to improve its magnetic properties, comprising: placing said magnetic material in an essentially unidirectional magnetic field and, imparting mechanical vibrations to said magnetic material while said magnetic material is in said magnetic



field and independently of the application of the magnetic field.

4,437,909

PROCESS FOR PRODUCING A GRAIN-ORIENTED SILICON STEEL SHEET OR STRIP HAVING EXCELLENT MAGNETIC PROPERTIES

Kensuke Mori, Himeji; Hiromi Matsumoto, Kitakyushu; Yozo Suga, Kitakyushu; Tadashi Nakayama, Kitakyushu, and Fumio Matsumoto, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,878

Claims priority, application Japan, May 30, 1981, 56-83072

Int. Cl.³ H01F 1/04

U.S. Cl. 148—111 **8 Claims**

1. A process for producing a grain-oriented silicon steel strip or sheet, wherein a silicon steel slab containing from 2.0 to 4.5% by weight of silicon and not more than 0.080% by weight of carbon is subjected to hot-rolling and then to cold-rolling, the cold-rolling being carried out in either one step or two steps to obtain a thickness of a final product, an intermediate annealing being carried out between the two cold rolling steps, decarburization annealing being carried out, and, after applying an annealing separator, final high-temperature annealing being carried out so as to form a {110} <001> texture, characterized in that during hot rolling said silicon slab is subjected, at a temperature range of from 850° C. to 1160° C., to at least one pass in which the axial lines of the top working roll and the bottom working roll are non parallel, and as a result of these working rolls being non parallel, the grain-oriented electromagnetic steel sheet or strip has no streaks and has a high magnetic flux density.

4,437,910

PROCESS FOR PRODUCING GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET

Tadao Nozawa, Munakata; Takaaki Yamamoto, Kitakyushu; Tadashi Nakayama, Kitakyushu; Fumio Matsumoto, Kitakyushu, and Satohiro Hayami, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 28, 1981, Ser. No. 267,855

Claims priority, application Japan, Jun. 4, 1980, 55-75033

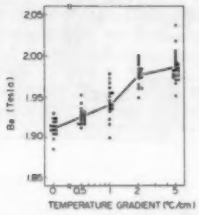
Int. Cl.³ H01F 1/04

U.S. Cl. 148—112 **10 Claims**

1. In a process for producing a grain-oriented silicon steel sheet with secondary recrystallized grains having a high degree of (110)[001] orientation and increased magnetic flux density by a secondary recrystallization annealing of a silicon steel sheet having a primary recrystallized structure, the improvement wherein the secondary recrystallization proceeds towareds the primary recrystallized grain region and is completed over the entire area of the steel sheet, while a temperature gradient of not less than 2° C./cm is generated in any direction of the short width direction, longitudinal direction or intermediate direction of said first two directions of the steel

sheet at the boundary region between the primary recrystallized grain region and the secondary recrystallized grain region formed upon reaching the secondary recrystallizing temperature.

10. A grain-oriented silicon steel sheet with secondary recrystallized grains having a high degree of (110)[001] orientation and increased magnetic flux density produced by a process in which a silicon steel sheet having a primary recrystallized structure is primary recrystallization annealed in such a manner that the secondary recrystallization proceeds toward the primary recrystallized grain region and is completed over the entire area of the steel sheet, while a temperature gradient of not less than 2° C./cm is generated in any direction of the short width direction, longitudinal direction or intermediate direction of said first two directions of the steel sheet at the boundary region between the primary recrystallized grain region and the secondary recrystallized grain region formed upon reaching the secondary recrystallizing temperature.



4,437,911

BETA ALLOYS WITH IMPROVED PROPERTIES

Lucas J. Delaey, Bertem, Belgium, assignor to Leuven Research & Development V.Z.W., Louvain, Belgium

Filed Jul. 20, 1982, Ser. No. 400,017

Claims priority, application Netherlands, Jul. 30, 1981, 8103612

Int. Cl.³ C22C *9/04*; C22F *1/08*

U.S. Cl. 148—402 **12 Claims**

1. A shape memory beta copper alloy with improved fatigue strength properties and with an adjustable Ms-temperature, consisting essentially of 4–40% by weight of Zn, 1–12% by weight of Al, 0.01–2% by weight of Co, 0–8% by weight of Mn, 0–4% by weight of Ni and the balance Cu, said alloy showing on heating to a first temperature a transition from an (alpha+beta)-region, an (alpha+beta+gamma)-region or a (beta+gamma)-region to a beta-region, said alloy having an average grain size of less than 200 μm and containing cobalt- and aluminium bearing precipitates, the average size of which is less than 10 μm and which are insoluble in the alloy below a second temperature that is higher than said first temperature.

4,437,912

AMORPHOUS MAGNETIC ALLOYS

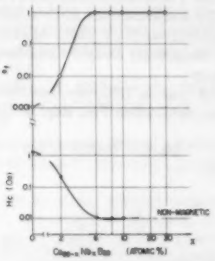
Hiroshi Sakakima, Hirakata; Mitsuo Satomi, Katano; Harufumi Senno, Yamatokoriyama, and Eiichi Hirota, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 16, 1981, Ser. No. 321,560

Claims priority, application Japan, Nov. 21, 1980, 55-164978

Int. Cl.³ C22C *19/00*

U.S. Cl. 148—403 **4 Claims**



1. Amorphous alloy consisting of 60–94 atomic % of at least one of Fe, Co and Ni, and 2 to 20 atomic % of niobium, the balance being at least one other metal selected from the group consisting of Ti, Zr, Hf, V, Ta and Ru.

4,437,913

COBALT BASE ALLOY

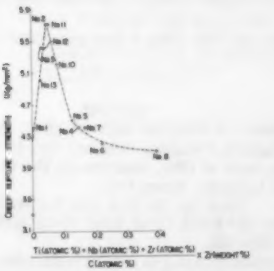
Yutaka Fukui, and Tetsuo Kashimura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 98,665, Nov. 29, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,514

Claims priority, application Japan, Dec. 4, 1978, 53-149135

Int. Cl.³ C22C *19/07*

U.S. Cl. 148—408 **10 Claims**



1. A cobalt base cast alloy consisting essentially of, by weight, 0.15 to 2% carbon, less than 2% silicon, less than 2% manganese, 5 to 15% nickel, 18 to 35% chromium, 3 to 15% tungsten, 0.003 to 0.1% boron, 0.01 to 1% niobium, 0.01 to 1% titanium, 0.01 to 1% zirconium, less than 10% iron, less than 1% tantalum, less than 1% hafnium and the remainder substantially cobalt, wherein the carbon (C), niobium (Nb), titanium (Ti) and zirconium (Zr) contents are so selected as to satisfy the following equation:

$$\frac{\text{Ti (atomic \%)} + \text{Nb (atomic \%)} + \text{Zr (atomic \%)}}{\text{C (atomic \%)}} \times \text{Zr (wt \%)} = 0.01 \text{ to } 0.17$$

and wherein there exist eutectic carbides and secondary carbides precipitated by an age-treatment in uniformly dispersed form in the vicinity of grain boundaries whereby growth of the secondary carbides is suppressed; said alloy having a creep rupture strength of higher than 4.3 Kg/mm^2 in 1,000 hours creep rupture at 982° C. and a reduction of area of at least 34% in 100 hours creep rupture at 982° C.

4,437,914

METHOD OF PRODUCING SHEATHED CABLES AND/OR TRANSDUCERS AND A DEVICE FOR CARRYING OUT THIS METHOD

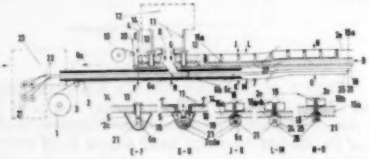
Franz Frischen, Kreppe 26, D-8359 Ortenburg-Dorfbach, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,455

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3109101

Int. Cl.³ H01B *13/26*

U.S. Cl. 156—54 **20 Claims**



1. A method of producing sheathed cables comprising:
bending a sheet material into a tube;
forming outwardly radial flanges of said tube parallel to an axis of said tube;
gripping said flanges in frictional engagement by a gripping means;
separately inserting at least one lead and an insulating material into said tube;
drawing said flanges in a radial direction against an abutment, whereby a diameter of said tube is reduced and said insulating material is simultaneously compressed;
inserting a cover band over said insulating material prior to said drawing of said flanges;
welding said tube along a seam parallel to said axis of said tube.

4,437,915

METHOD OF CURING REMOVABLE TREAD BELT

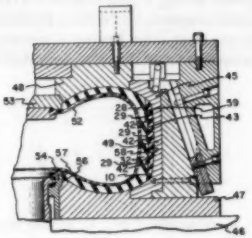
Paul E. Appleby, Cuyahoga Falls, and Max D. Brinkley, North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

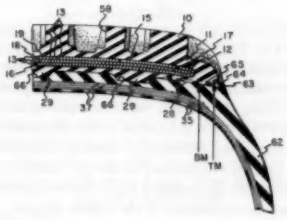
Filed Oct. 13, 1981, Ser. No. 310,448

Int. Cl.³ B29H *17/02*; B60C *11/02*; B29H *21/04*

U.S. Cl. 156—126 **11 Claims**

1. A method of curing an annular replaceable tread belt body of uncured resilient material having reingorcing cords of high modulus material comprising:
a. mounting said annular tread belt body on a radially outer surface of a precured tire casing having a curing medium chamber therein;
b. supporting said tire casing in a segmental mold having radially movable segments for engagement with said tread belt body;
c. closing said mold;
d. transmitting a curing medium at high temperatures and pressures into said chamber within said tire casing to press the radially outer surface of said tread belt body into molding contact with said segments;
e. curing said tread belt body in said mold at predetermined temperatures and pressures for a predetermined period of time;
f. reducing the pressure of said curing medium in said chamber within said tire casing;
g. moving said radially movable segments radially outward out of engagement with said tread belt body;





h. opening said mold; and
i. removing said tread belt from said tire casing.

4,437,916

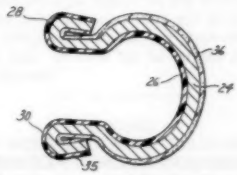
METHOD OF MANUFACTURING EDGE GUARDS

Robert Adell, Novi, Mich., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Nov. 23, 1981, Ser. No. 323,510

Int. Cl.³ B31F *1/00*; B29C *19/00*; B32B *31/00*; B23P *14/00*

U.S. Cl. 156—222 **2 Claims**



1. The method of making an insulated, self-retaining metallic edge guard of the type comprising a metal channel of generally U-shaped cross section having an interior and an exterior and inner and outer legs, including beads at distal ends of the legs, via which self-retention forces are applied to an edge of an object on which the edge guard is to be installed, and protective insulation on the interior of the channel to insulate the metal of the channel from an edge of the object on which the edge guard is to be installed and with the exterior of the channel being exposed to view when in use, said insulated metallic edge guard being made from a strip of metal on one side of which the protective insulation is applied to completely cover said one side, said method comprising applying a protective layer of a material different from that of said protective insulation to a side of the metal strip opposite that to which the protective insulation is applied to thereby completely cover said other side, roll forming the strip, including the protective

insulation and the protective layer into a U-shaped cross section of desired configuration to form said inner and outer legs and to form said beads by outwardly reversing the distal ends of the legs so that the protective insulation lines the entire interior of the U-shaped channel, and the protective layer the entire exterior except at said beads where the protective insulation, instead of the protective layer, is visible on the exterior of the roll-formed edge guard, and then when the edge guard is put to use, removing the protective layer from the exterior of the channel to reveal the metal of the channel to view.

4,437,917

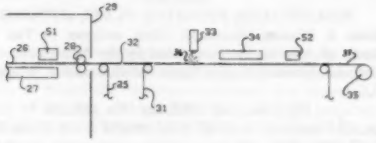
CONTROL OF BULK IN AIR LAID FIBROUS WEBS

Thomas M. Tao, Neenah, Wis. and William C. Bean, Larsen, Wis., assignors to James River/Dixie-Northern, Inc., Norwalk, Conn.

Continuation of Ser. No. 219,613, Dec. 24, 1980, abandoned. This application Mar. 15, 1983, Ser. No. 475,617

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—296 **12 Claims**



1. A method of increasing bulk of dry-formed fibrous webs during their manufacture, comprising the steps of:

forming a loose web of fibers dispersed on a forming wire in a zone under temperature and humidity conditions that cause the loose web to have a moisture content of more than 4% by weight;

partially drying the loose web to reduce the moisture content of the web to less than 4% by weight; and

subjecting the loose, partially dried web to compaction or consolidation to impart some strength to the web.

4,437,918

METHOD OF MAKING A CARPET TILE

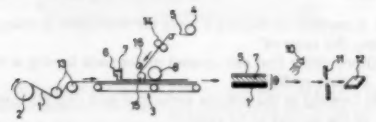
Kazuo Morohashi, Yokohama; Teruo Kajikawa, Yokosuka, and Sakuya Iwai, Tokyo, all of Japan, assignors to Nippon Oil Company Ltd., Japan

Continuation of Ser. No. 254,044, Apr. 14, 1981, abandoned. This application Feb. 24, 1983, Ser. No. 469,296

Claims priority, application Japan, Apr. 25, 1980, 55-51654; May 10, 1980, 55-61235

Int. Cl.³ B32B *31/08, 31/26*

U.S. Cl. 156—322 **2 Claims**



1. In a method of making an asphaltic composition-backed carpet tile including feeding a carpet onto a conveyor through a roll guider from a carpet feeding section, advancing the conveyor with the carpet along a feedpath, directing a heated thermoplastic asphaltic composition backing onto the carpet as it is fed along the conveyor and applying it to the carpet so as to form an asphaltic composition-backed carpet on the conveyor, feeding a secondary backing fabric through a cloth guider along its course of running from a secondary backing fabric feed section onto the asphaltic composition-backed carpet and pressing them together by a pressure roll to form a laminated carpet belt material, cooling the laminated carpet belt material and cutting it into selected lengths, the improvement which comprises preheating said secondary backing fabric in the course of the running of said fabric, by a heater at a position upstream of said pressure roll, and thereafter passing said preheated fabric through an expander roll at a position downstream of the heater and upstream and adjacent to said pressure roll for opening and removing wrinkles from said preheated fabric by the expander roll prior to the pressing together of said fabric and said asphaltic composition-backed carpet by said pessure roll.

4,437,919

ADHESIVE TOPCOATED POLYESTER MATERIAL AND PROCESS FOR INCORPORATING SAME INTO RUBBER

Edward J. Powers, Louisville, Ky., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Jun. 25, 1982, Ser. No. 391,909

Int. Cl.³ D02G *3/02, 3/36*

U.S. Cl. 156—329 **12 Claims**

1. A multi-filament polyester fibrous material for incorporation into rubber which bears a lubricant topcoat comprising the combination,

at least about 5% to about 50% by weight, based on the weight of the topcoat, of a dissolved, active isocyanate compound, and at least about 20% by weight, based on the weight of the topcoat of an endcapped silicone glycol copolymer.

10. In a process for preparing a polyester reinforced rubber article wherein a multi-filament fibrous material is coated with an RFL latex, is heated and a layer of rubber is applied and cured on the thus treated fibrous material, the improvement comprising: providing on said polyester multi-filament fibrous material prior to coating with said RFL latex a topcoat, said topcoat comprising the combination of:

at least about 5% to about 50% by weight, based on the weight of the topcoat, of a dissolved active isocyanate compound, and

at least about 20% by weight, based on the weight of the topcoat of an endcapped silicone glycol copolymer.

4,437,920

APPARATUS FOR PRODUCT TRANSPORTATION IN TIRE-FORMING MACHINE

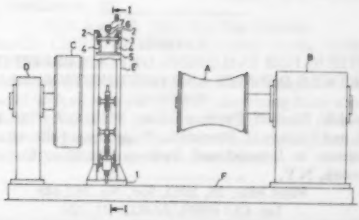
Masayoshi Kubo, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Nagasaki, Japan

Filed Apr. 15, 1982, Ser. No. 368,856

Claims priority, application Japan, Apr. 20, 1981, 56-59518

Int. Cl.³ B60C *17/10, 17/37*

U.S. Cl. 156—406.2 **1 Claim**



1. A tire forming machine mounted on a base and including thereon a forming drum and a transport apparatus for transporting green tire or an intermediate assembly body for green tire, the transfer apparatus including transfer means for holding said green tire or body and movable in the axial direction of the forming drum, a pair of circular plates which are parallel to each other and attached to said transfer means, a plurality of shafts rotatably mounted on said circular plates at substantially equal intervals in the circumferential direction and positioned on a circle concentric with the circle of said circular plates,

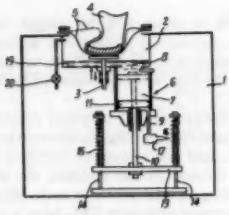
levers fixed on said shafts to pivot therewith, product-holding means connected to said levers for holding said green tire or body, an angular lever fixed to each of said shafts and pivotable therewith, link members connecting said angular levers in pairs, said angular levers and said link members being mutually combined to form a number of parallelogram links having mutually cooperatuve movement, and at least one driving means for swinging said angular levers to thereby open and close said product holding means upon said green tire or body.

4,437,921

PRESS FOR GLUING FOOTWEAR ELEMENTS

Lucien Bichet, Dravel, France, assignor to Anver S.A., Maisons-Alfort, France

Filed Nov. 10, 1982, Ser. No. 440,727
Claims priority, application France, Nov. 25, 1981, 81 22024
Int. Cl.³ B30B *15/00*
U.S. Cl. 156—475 **9 Claims**



1. A press for gluing footwear elements to each other comprising a tank, means for supporting an article of footwear in said tank, a flexible pocket adapted to envelope at least the portion of said article of footwear which includes said footwear elements which are to be glued to each other, wherein the improvement comprises a jack including a cylinder and a piston movable in said cylinder, said piston being adapted to be moved by the application of a pressurized pneumatic fluid to one surface of said piston, the opposite surface of said piston communicating with a liquid supply in said tank, whereby movement of said piston is operable to force said liquid under pressure against said flexible pocket to cause said flexible pocket to conform to the contour of the footwear elements which are to be glued to each other whereby to cause said elements to become glued to each other, and means for moving said piston to a retracted position when the pneumatic pressure on said piston is relieved.

4,437,922

METHOD FOR TAILORING OXYGEN PRECIPITATE PARTICLE DENSITY AND DISTRIBUTION SILICON WAFERS

Bernard K. Bischoff, Putnam Valley; William J. Patrick, Fishkill, and Thomas H. Strudwick, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,448
Int. Cl.³ H01L *21/322, 21/324*
U.S. Cl. 156—603 **10 Claims**

1. A method for tailoring oxygen precipitate particle density and distribution in a silicon wafer, comprising the steps of:

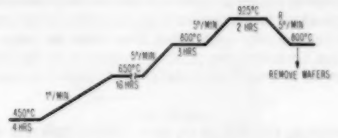
heating the silicon wafer to a first high temperature at a rate higher than 10° C./minute, said first high temperature being sufficiently high to reduce the number of pre-existing oxygen clusters,

keeping said wafer at said first high temperature for a period sufficient to allow outdiffusion of oxygen,

allowing said wafer to cool,

annealing said wafer at a low temperature, said low temperature being sufficiently low to nuceleate precipitated oxygen, and

heating said wafer to a second high temperature at a rate lower than 2° C./minute, said second high temperature



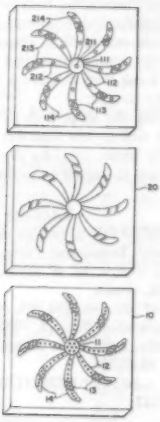
being sufficiently high to grow the precipitated oxygen nucleated at said low temperature to a size which ensures survival of the precipitated oxygen in subsequent processing.

4,437,923

MULTICOLOR PRINTING PLATE JOINING

William J. Waters, Cleveland, Ohio, assignor to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 28, 1982, Ser. No. 425,203
Int. Cl.³ B44C *1/22*; C23F *1/02*; B41M *1/00*; B21D *39/00*
U.S. Cl. 156—630 **9 Claims**



1. A method of making a plate for multicolor printing comprising the steps of:

(a) providing first and second plates each having a top and bottom surface;

(b) forming in the bottom surface of said first plate patterns of the images to be printed;

(c) forming a plurality of apertures extending through said first plate, said apertures being distributed within said patterns;

(d) forming in said bottom surface of said second plate a plurality of ink distribution channels, each channel having a shape such as to enclose all the apertures of a respective pattern when the plates are juxtapositioned;

(e) forming at least one ink input port in each distribution channel;

(f) coating each ink distribution channel of said second plate with a liquid removeable solder mask;

(g) coating said bottom surface of said second plate with solder;

(h) pressing the bottom surface of said second plate against the top surface of said first plate;

(i) heating said plates for a time period sufficient to fuse them together;

(f) flowing a solder mask dissolving liquid through the ports, apertures and channels of said plates to remove said solder mask whereby a solder-joined multicolor printing plate is produced.

4,437,924

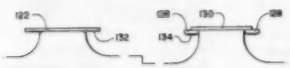
METHOD OF MAKING FINE-LINE DIE

Walter Weglin, Bellevue, Wash., assignor to Jerobee Industries, Inc., Redmond, Wash.

Filed Apr. 19, 1982, Ser. No. 369,906

Int. Cl.³ C23F *1/02*; C03C *15/00, 25/06*; B44C *1/22*

U.S. Cl. 156—651 **13 Claims**



1. A method for fabricating a precision die by chemical milling the working face of an etchable workpiece form a plurality of raised die elements separated and bounded by a plurality of cavities, said method comprising the steps of:

a. forming an etchant-resistant surface pattern of boundary grooves penetrating slightly into the working face of an etchable workpiece outwardly proximate and substantially conforming to a desired configuration for die element precursors; and,

b. selectively etching said workpiece in regions outwardly bounded by said boundary grooves to undercut said grooves and form recessed cavities outwardly proximate and substantially conforming to the complementary configuration of said die element precursors.

4,437,925

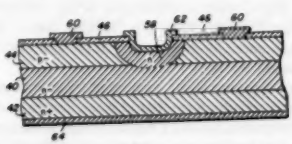
ETCHED-SOURCE STATIC INDUCTION TRANSISTOR

Adrian I. Cogan, Waltham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 320,242, Nov. 12, 1981. This application Sep. 12, 1983, Ser. No. 531,373

Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*

U.S. Cl. 156—653 **4 Claims**



1. A method for forming a gate-source structure for a static induction transistor, said method comprising the steps of:

growing a high resistivity epitaxial silicon layer of one conductivity type on a semiconductor substrate also of said one conductivity type;

growing a high resistivity epitaxial silicon layer of opposite conductivity type on said one-type epitaxial layer;

forming a silicon dixode layer on said opposite-type epitaxial layer;

opening parallel source windows and gate windows in said silicon dioxide layer;

growing a thin silicon dioxide layer in said source windows and said gate windows;

protecting said gate windows by photolithographic masking;

removing said thin silicon dixode layer in each of said source windows;

removing said protective photolithographic masking from said gate windows;

etching source grooves in said opposite-type epitaxial layer at the location of said source windows;

depositing one-type impurities on the surface of said source grooves;

diffusing said one-type impurities into said opposite type epitaxial layer to form a diffused region, said diffused region extending to form a channel to said one-type epitaxial layer;

removing said thin silicon dioxide layer from each of said gate windows; and

depositing metal and patterning gate electrodes and source electrodes in said gate windows and said source windows respectively.

4,437,926

METAL ALLOY WITH HIGH CATALYTIC ACTIVITY

Jean-Louis Barnabe, Chatou, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Division of Ser. No. 166,400, Jul. 7, 1980, Pat. No. 4,384,891. This application Sep. 30, 1982, Ser. No. 429,543

Int. Cl.³ H01L *1/22*; B22D *25/00*; B01J *21/18*; C25F *3/08*

U.S. Cl. 156—654 **4 Claims**

1. A method for producing an alloy consisting essentially of:

iron: 40–80% by weight

nickel: 0–40% by weight

Chromium: 0–40% by weight

carbon: 0.02–0.1% by weight

at least one platinum group metal: 0.05–2% by weight

comprising melting under vacuum or in air, said alloy having a carbon content of between 0.02 and 0.1% and a platinum metal content from 0.05 to 2%, treating the resulting product by annealing at a temperature of about 1150° C., then forming into thin elements such as sheets, wires, or chips, which are subjected in turn to successive annealing at a temperature between 1050° C. and 1150° C. and heating again between 400° C. and 800° C. for a period of time between 30 minutes and 10 hours producing sensitization to intergranular corrosion; then cleansing the surface of the alloy and subjecting to intergranular corrosion in an acid bath of chloronitric type, producing rapid microfissutation, then immersing in a 20% aqueous hydrochloric acid for two minutes and heating in a solution of between 5% and 30% oxalic acid at a temperature between 60° and 90° C. for about two hours, then oxidizing the resulting product at about 350° C.

4,437,927

DISSOLUTION OF METALS UTILIZING A LACTONE

Kwee C. Wong, Youngstown, Ohio, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 22, 1983, Ser. No. 524,965

Int. Cl.³ C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—666 **21 Claims**

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a lactone.

4,437,928

DISSOLUTION OF METALS UTILIZING A GLYCOL ETHER

Kwee C. Wong, Youngstown, Ohio, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 22, 1983, Ser. No. 525,070

Int. Cl.³ C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—666 **19 Claims**

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a glycol ether.

4,437,929
DISSOLUTION OF METALS UTILIZING PYRROLIDONE

Kwee C. Wong, Youngstown, Ohio, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 22, 1983, Ser. No. 525,071
Int. Cl.³ C23F 1/00; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—666 **21 Claims**

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a pyrrolidone.

4,437,930
DISSOLUTION OF METALS UTILIZING ε-CAPROLACTAM

Kwee C. Wong, Youngstown, Ohio, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 22, 1983, Ser. No. 525,072
Int. Cl.³ C23F 1/00; B44B 1/22; C03C 15/00, 25/06
U.S. Cl. 156—666 **15 Claims**

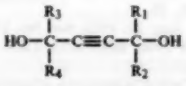
1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of ε-caprolactam.

4,437,931
DISSOLUTION OF METALS

Moenes L. Elias, Canfield, and Walter L. Burger, Salem, both of Ohio, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 22, 1983, Ser. No. 525,078
Int. Cl.³ C23F 1/00; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—666 **13 Claims**

1. In a process for the dissolution of metals in which a metal is contacted with an aqueous solution containing free chloride or bromide ions, from about 0.2 to about 4.5 gram moles per liter of sulfuric acid and from about 0.25 to about 8 gram moles per liter of hydrogen peroxide, the method of increasing the metal dissolution rate of the solution in the presence of chloride or bromide ions to a value higher than that obtained by such a solution free of any chloride and bromide ions, which method comprises adding an effective amount of a diol promoter having the general formula:



where R_1, R_2, R_3 and R_4 can be either H, CH_3, OC_2H_5 or OC_3H_8.

4,437,932
DISSOLUTION OF METALS UTILIZING A FURAN DERIVATIVE

Kwee C. Wong, Youngstown, Ohio, assignor to Dart Industries Inc., Northbrook, Ill.

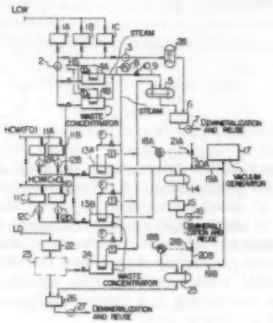
Filed Aug. 22, 1983, Ser. No. 525,080
Int. Cl.³ C23F 1/00; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—666 **23 Claims**

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of a furan.

4,437,933
APPARATUS FOR TREATING RADIOACTIVE LIQUID WASTES

Ryozo Kikkawa, Hitachi, and Masaki Takeshima, Komae, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 238,041, Feb. 25, 1981, abandoned. This application Jul. 16, 1982, Ser. No. 398,853
Claims priority, application Japan, Feb. 26, 1980, 55-23622
Int. Cl.³ B01D 1/26, 1/28; G21F 9/08, 9/20
U.S. Cl. 159—17 R **6 Claims**



1. An apparatus for treating radioactive liquid waste from atomic power plant, which comprises:

a low electroconductivity liquid waste concentrator of the pressurized evaporation type, for evaporating a low electroconductivity liquid waste with outside steam as a heat source at high temperature,

a high electroconductivity liquid waste concentrator of the vacuum evaporation type, for evaporating a high electroconductivity liquid waste with the steam generated by evaporation of the low electroconductivity liquid waste,

a laundry liquid waste concentrator of the vacuum evaporation type for evaporating a laundry liquid waste with steam generated by evaporation of the low electroconductivity liquid waste,

means for supplying steam generated by evaporation in said low electroconductivity liquid waste concentrator to said high electroconductivity liquid waste concentrator as a heat source for low electroconductivity liquid waste concentration,

means for supplying steam generated by evaporation in said low electroconductivity liquid waste concentrator to said laundry liquid waste concentrator as a heat source for laundry liquid waste concentration,

a low electroconductivity liquid waste condenser for condensing the steam from said low electroconductivity liquid waste concentrator, said high electroconductivity liquid waste concentrator and said laundry liquid waste concentrator,

a high electroconductivity liquid waste condenser for condensing the steam from said high electroconductivity liquid waste concentrator,

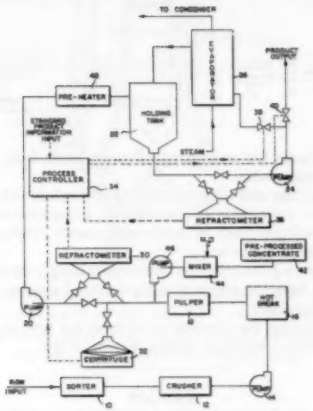
a laundry liquid waste condenser for condensing the steam from said laundry liquid waste concentrator, and

means for demineralization of condensed low electroconductivity liquid waste, high electroconductivity liquid waste and laundry liquid waste.

4,437,934
METHOD FOR CONTROLLING CONSISTENCY OF TOMATO PRODUCTS

Philip E. Nelson, W. Lafayette, Ind., and Norihisa Takada, Gumma, Japan, assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Sep. 13, 1982, Ser. No. 417,184
Int. Cl.³ B01D *1/00*; A23L *1/212*
U.S. Cl. 159—47.1 **9 Claims**



1. A process for manufacturing tomato products to an established consistency standard, comprising the steps of:

introducing into a system a tomato extract feedstock having an initial precipitate weight ratio and an initial Brix level,

measuring the initial precipitate weight ratio and initial Brix level of the tomato extract feedstock,

calculating an expected precipitate weight ratio of the tomato product selected for manufacture from the tomato extract feedstock,

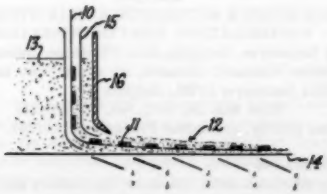
computing an expected Brix level of the tomato product selected for manufacture from the tomato extract feedstock, and

concentrating the tomato extract feedstock while measuring the Brix level thereof until the expected Brix level is achieved.

4,437,935
METHOD AND APPARATUS FOR PROVIDING SECURITY FEATURES IN PAPER

Frederick G. Crane, Jr., Dalton, Mass., assignor to Crane and Company, Dalton, Mass.

Filed Jun. 3, 1981, Ser. No. 269,850
Int. Cl.³ D21D *3/00*; D21H *5/10*
U.S. Cl. 162—103 **2 Claims**



1. A method for producing identifiable paper during the paper forming process on a paper making machine comprising the steps of:

attatching a security device consisting of a plastic film diffraction grating to one surface of a carrier web of water-dispersible paper;

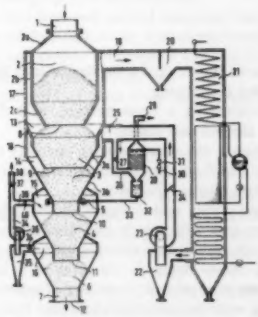
positioning the carrier paper and security device relative to a predetermined position on a base paper web of less porous web density than said carrier web during the deposition and dewatering of said base paper web from a water suspension of said base paper fibers; and

dispersing the carrier paper web to integrally join the security device to said one surface of the base paper.

4,437,936
PROCESS FOR UTILIZING WASTE HEAT AND FOR OBTAINING WATER GAS DURING THE COOLING OF INCANDESCENT COKE

Richard A. Jung, Gummersbach, Fed. Rep. of Germany, assignor to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 361,053
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112256
Int. Cl.³ C10B *27/00*, *39/02*, *39/04*
U.S. Cl. 201—39 **7 Claims**



1. A process for utilizing waste heat and for obtaining water gas during the cooling of incandescent coke ejected from a chamber oven, this process comprising two stages, in which

(a) in a first stage, dry-cooling is effected with a cooling gas, wherein the cooling gas enters the lower region of a cooling zone, rises by counterflow through the coke falling in the cooling zone, thereby absorbing heat, flows out from the cooling zone in the upper region thereof, is recooled in a heat sink and is then cleaned, and is recirculated into the lower region of the cooling zone, and

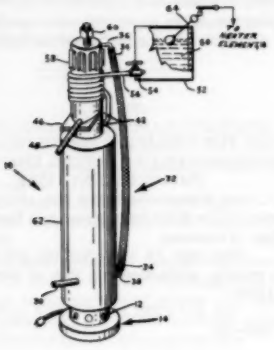
(b) in a second stage, at a lower coke temperature relative to the first stage, the coke is wet-cooled with water sprayed in a quenching zone, whereupon the cooled coke is discharged via a discharge zone,

including, in the first stage according to (a), forming a mixture of water gas and water vapor which is used as the cooling gas, and wherein, in the second stage according to (b), the water vapor formed during evaporation of the water sprayed into the quenching zone is conveyed through the coke, portion of said water vapor being drawn off from there, discharged into the environment after cleaning and/or fed back into the quenching zone and wherein a portion of said water vapor is conveyed through the coke into the cooling zone located above the quenching zone and reacts with the coke to form said mixture of water gas and water vapor.

4,437,937
CONTINUOUS TRICKLE-DOWN DISTILLATION UNIT FOR PRODUCING HYDRATED ALCOHOL

Thomas F. McGraw, 9034 Ashmeade Dr., Fairfax, Va. 22032

Filed Dec. 3, 1981, Ser. No. 327,135
Int. Cl.³ B01D *3/28;* C07C *29/80*
U.S. Cl. 202—160 4 Claims



1. A continuous trickle-down distillation unit for producing hydrated alcohol comprising:

means for containing a fluid mixture, said fluid mixture including alcohol and water;

a single, compact, elongated housing operably connected to and below said fluid mixture containing means for receiving said fluid mixture therefrom;

means situated within said elongated housing for increasing the surface area with which said fluid mixture comes in contact with as it passes therethrough, said surface area increasing means being in the form of a labyrinth-like structure made up of small fragments of material incapable of reacting with the constituents of said fluid mixture;

an electrical heater element operably connected within the bottom of said elongated housing for heating the interior of said housing and said labyrinth-like structure to a predetermined temperature, and means operably connected to said heater element for controlling said electrical heater element so as to maintain said predetermined temperature, said predetermined temperature being in the range of 170°–180° F., whereby alcohol-predominant vapors rise in said housing;

means in direct communication with said elongated housing for condensing said alcohol-predominant vapors into hydrated alcohol, said condensing means including a chamber and a plurality of fin-like elements protruding from said chamber for passively cooling said chamber;

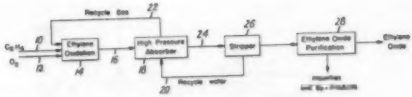
means operably connected to said chamber for directing said hydrated alcohol out of said distillation unit, said directing means including a plate extending partially within said chamber for receiving said hydrated alcohol and directing said hydrated alcohol through an output line; and

means operably connected to said elongated housing for directing remaining liquid constituents of said fluid mixture out of said distillation unit, said remaining liquid constituent directing means including means situated within said housing in the form of a cone-shaped element adjacent said heater element for preventing said remaining liquid constituents of said fluid mixture from contacting said heater element during the distillation process.

4,437,938
PROCESS FOR RECOVERING ETHYLENE OXIDE FROM AQUEOUS SOLUTIONS

Vijay S. Bhise, Bloomfield, N.J., and Robert Hoch, Ridgewood, N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,153
Int. Cl.³ B01D *3/34;* C07D *301/32*
U.S. Cl. 203—14 6 Claims



1. A process for recovering ethylene oxide from aqueous solutions comprising:

(a) contacting said aqueous solution of ethylene oxide with a solvent comprising carbon dioxide in the near-critical or super-critical state to selectively absorb ethylene oxide relative to water and;

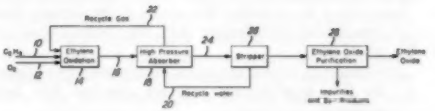
(b) separating the ethylene oxide-containing carbon dioxide of (a) from the ethylene oxide-depleted aqueous solution and thereafter;

(c) recovering the ethylene oxide from the separated ethylene oxide-containing carbon dioxide of (b).

4,437,939
PROCESS FOR SEPARATING ETHYLENE OXIDE FROM AQUEOUS SOLUTIONS

Vijay S. Bhise, Bloomfield, N.J., and Robert Hoch, Ridgewood, N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 284,153, Jul. 17, 1981. This application Nov. 16, 1981, Ser. No. 321,966
Int. Cl.³ B01D *3/34;* C07D *301/32*
U.S. Cl. 203—14 6 Claims



1. In a process for recovering ethylene oxide from aqueous solutions wherein carbon dioxide at near-critical or super-critical conditions extracts ethylene oxide and thereafter the extracted ethylene oxide is separated from the carbon dioxide by distillation at sub-critical conditions, the improvement comprising adding an amount of a gas or gases to said carbon dioxide sufficient to provide a critical temperature for the carbon dioxide-ethylene oxide-added gas mixture at the top of said distillation column between 32° C. and 75° C.

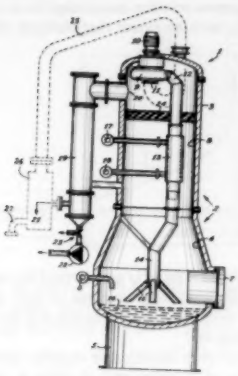
4,437,940
PROCESS FOR AUTOMATIC AND CONTINUOUS VAPORIZATION AND CONDENSATION

Robert Sussmeyer, Brussels; Alain Pluvinage, Irchonwelz, and Christian Moenaert, Brussels, all of Belgium, assignors to Ateliers Sussmeyer SPRL, Belgium

Filed May 24, 1982, Ser. No. 381,223
Claims priority, application France, Jun. 4, 1981, 81 11054
Int. Cl.³ F01D *9/02*
U.S. Cl. 203—49 4 Claims

1. An automatic and continuous vaporization and condensation process for the fractionation of a mixture comprising at least one liquid volatile fraction comprising the steps of continuously circulating a vapor of the volatile fraction, superheating

said continuously circulating vapor, injecting said superheated vapor into the mixture to be fractionated to which it releases its superheated heat for vaporizing at least one liquid fraction



condensing and collecting a portion of the vapor of volatile fraction and controlling the ratio of condensed and recirculated volatile fractions so that a substantially constant amount thereof is continuously circulated and superheated.

4,437,941

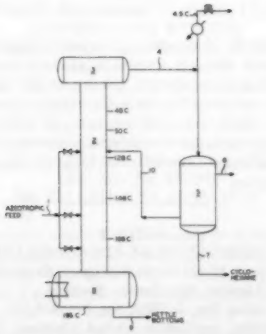
SEPARATION OF HYDROCARBON AND ALCOHOL AZEOTROPIC MIXTURES BY DISTILLATION WITH ANHYDROUS AMMONIA

Stanley J. Marwil, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 7, 1982, Ser. No. 376,075

Int. Cl.³ B01D *3/36*; C07C *7/06, 29/82*

U.S. Cl. 203—50 **15 Claims**



1. A process for separating an azeotropic mixture comprising a hydrocarbon and an alcohol which comprises:

adding to the azeotropic mixture an effective amount of anhydrous ammonia and, under distillation conditions, removing a vapor phase comprising the hydrocarbon, ammonia and no more than a minor amount of the alcohol, and removing a liquid phase comprising the major portion of the alcohol.

4,437,942

METHODS FOR PRODUCING PRINTING PLATES, AND PRINTING PLATES PRODUCED THEREBY

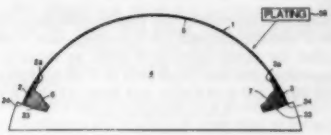
Max Dätwyler, Langenthal, Switzerland, assignor to MDC Max Dätwyler AG, Bleienbach, Switzerland

Continuation-in-part of Ser. No. 279,383, Jul. 1, 1981, abandoned. This application Jan. 6, 1982, Ser. No. 337,561

Claims priority, application Switzerland, Jul. 10, 1980, 5290/80

Int. Cl.³ C25D *1/20, 5/00*

U.S. Cl. 204—6 **62 Claims**



1. In a method of producing a wrap-on printing plate with first and second clamping bars along opposite sides thereof for installation on a printing cylinder, the improvement comprising in combination the steps of:

providing a layer defining a printing plate body;

forming from marginal portions of said layer, along opposite sides thereof, first and second foundations for said first and second clamping bars, respectively;

providing said first and second clamping bars on said first and second foundations by interatomic bonding between said first and second foundations and said first and second clamping bars, respectively; and

finishing said printing plate body and clamping bars.

4,437,943

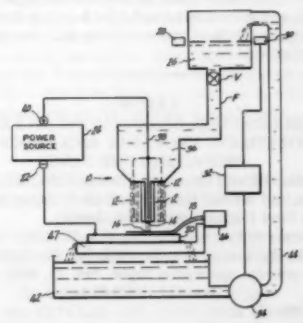
METHOD AND APPARATUS FOR BONDING METAL WIRE TO A BASE METAL SUBSTRATE

Alexander F. Beck, Hamden, and Joseph Winter, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 9, 1980, Ser. No. 167,178

Int. Cl.³ C25D *5/02, 5/08*

U.S. Cl. 204—16 **20 Claims**



1. An apparatus for bonding a substrate to a lead wire comprising:

means for supporting said substrate and said lead wire in an overlappiing relationship and in physical contact with each other; and

means for electrodepositing a spot of material over at least a portion of said substrate and said lead wire to firmly bond said physically contacting substrate and lead wire.

4,437,944

PROCESS OF MAKING LONG-LIFE THIN METAL PLATE FOR AUTOMOBILE BODIES

Roberto Bruno, and Massimo Memmi, both of Rome, Italy, assignors to Zincroksid S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 173,234, Jul. 28, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 219,112

Int. Cl.³ C25D *11/38*

U.S. Cl. 204—27 5 Claims

1. A process for producing sheet steel for long life motor vehicle bodies, comprising the steps of:

depositing a layer of zinc on only one face of the sheet steel, and

thereafter simultaneously applying to both faces of the sheet steel a chrome-chromic oxide coating, said coating being applied by electrodeposition from an aqueous solution comprising, per liter: from 0.05 to 1 ml of H_2SO_4 at 96%; from 20 to 100 g of CrO_3; and from 0.5 to 3 g of CrF_3.

4,437,945

PROCESS FOR ANODIZING ALUMINUM FOIL

Mary A. Sells, Seymour, and John W. Scott, Clinton, both of Tenn., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 31, 1983, Ser. No. 528,182

Int. Cl.³ C25C *11/08, 11/12, 11/16*

U.S. Cl. 204—35 N 5 Claims

1. In an improved process for electrochemically anodizing aluminum electrolytic capacitor foil including the formation of a hydrous oxide layer on said foil before anodizing, then anodizing said foil and repeatedly interrupting said anodizing to subject the foil to a stabilizing treatment in a mildly alkaline borate bath of at least 80° C., the improvement comprising carrying out said anodizing in a bath containing monosodium phosphate and having a pH of 3.5 to 5.0.

4,437,946

STABILIZATION OF ALUMINUM ELECTROLYTIC CAPACITOR FOIL

Walter J. Bernard, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 31, 1983, Ser. No. 528,183

Int. Cl.³ C25C *11/08, 11/12, 11/18*

U.S. Cl. 204—35 N 4 Claims

1. A process for stabilizing anodized capacitor foil comprising passing said foil from an anodization step through a stabilizing bath containing a borate solution at a temperature of at least 80° C. and at a pH of 8.5 to 9.5 for from 2 to 8 minutes, and reanodizing, the cycle of said stabilizing and reanodizing being performed at least twice.

4,437,947

COLD ROLLED STEEL STRIP HAVING AN EXCELLENT PHOSPHATIZING PROPERTY AND PROCESS FOR PRODUCING THE SAME

Takao Saito, Himeji; Jyun-ichi Morita, Chita; Kikuji Hirose, Tatsuno, and Akitosi Kato, Tokai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 235,734, Feb. 18, 1981, abandoned. This application Sep. 15, 1982, Ser. No. 418,382

Claims priority, application Japan, Feb. 21, 1980, 55-20851

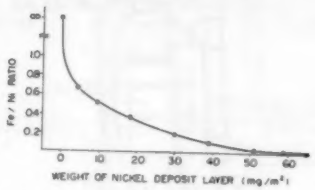
Int. Cl.³ C25D *5/44*

U.S. Cl. 204—35 R 5 Claims

1. A process for producing a cold-rolled steel strip having an excellent bonding property with a corrosion-resistant paint coating, comprising the steps of:

descaling at least one surface of a cold-rolled steel strip substrate to such an extent that the surface becomes substantially free from carbonaceous and oxide substances;

forming metallic nuclei scattered on said descaled surface of said cold-rolled steel strip substrate by depositing at least one transition elementary metal selected from the the group consisting of manganese in an amount of 5 to 300 mg/m², nickel in an amount of 1 to 50 mg/m², cobalt in an amount of 1 to 500 mg/m², copper in an amount of 1 to 100 mg/m², and molybdenum in an amount of 1 to 500 mg/m², by means of cathodic electrolytic decomposition applied to an aqueous solution containing the corresponding metal salt, to such an extent that portions of said descaled surface of said steel strip are covered by said metallic nuclei and the remaining portions of said steel strip surface are free from said metallic nuclei and are exposed to the atmosphere; and



immersing said steel strip having said metallic nuclei in an aqueous solution of a phosphate to form a phosphate coating on said steel strip surface.

4,437,948

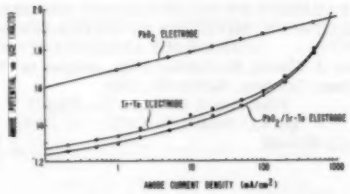
COPPER PLATING PROCEDURE

Yutaka Okinaka, Madison; Craig G. Smith, North Plainfield, and Lawrence E. Smith, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 16, 1981, Ser. No. 312,266

Int. Cl.³ C25D *3/38*

U.S. Cl. 204—52 R 11 Claims



1. A process for electroplating copper including the step of passing current through an anode, electroplating bath and cathode with a given current density at the surface of the anode characterized in that the surface of the anode consists of active oxide, said active oxide consisting of oxide of two metals, iridium and tantalum in which the composition of the oxide of two metals range from 20 to 90 mole percent iridium, remainder tantalum.

4,437,949

ELECTROLYSIS OF TIN COMPLEXES

Frank S. Holland, Hazel Grove Stockport, England, assignor to Manchem, Limited, Manchester, England

Filed Jan. 6, 1983, Ser. No. 456,317

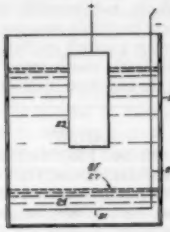
Claims priority, application United Kingdom, Jan. 7, 1982, 8200354

Int. Cl.³ C25C *5/02*

U.S. Cl. 204—59 M 13 Claims

1. An electrolytic method for the separate recovery of elemental tin and of an organic 'onium compound of the formula Cat^+X^- from a water-insoluble Cat^+ halogenotin complex produced as a by-product in the manufacture of organotin halides by the direct reaction of tin with an organic halide in the presence of said Cat^+X^- compound, wherein Cat^+ repre-

sents a positively-charged organic cation and X^- represents an inorganic anion, which method comprises passing an electric current through an electrolyte system between an anode which



is solely in contact with an aqueous anolyte and a cathode which is solely in contact with a water immiscible catholyte containing said water-insoluble complex.

4,437,950

METHOD OF CONTROLLING ALUMINUM ELECTROLYTIC CELLS

Yoji Arita, and Yuzo Seo, both of Yokohama, Japan, assignors to Itsubishi Keikinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,781

Int. Cl.³ C25C *3/06, 3/20*

U.S. Cl. 204—67 **6 Claims**

1. A method for controlling an aluminum electrolytic cell comprising the steps of detecting an increase or decrease in the quantity of alumina presenting in the bath or metal in said electrolytic cell in the solid state by calculating the difference between the quantity of alumina supplied to said electrolytic cell during an interval between an instant at which a previous anode effect has occurred or was anticipated to occur and an instant at which a present anode effect occurs or is anticipated to occur, and the quantity of alumina consumed during said interval, and increasing or decreasing the quantity of electric power supplied to said electric cell corresponding to the result of said detection.

4,437,951

MEMBRANE, ELECTROCHEMICAL CELL, AND ELECTROLYSIS PROCESS

Thomas C. Bissot, Newark, Del.; Walter G. Grot, Chadds Ford, Pa., and Paul R. Resnick, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 330,606, Dec. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 319,991, Nov. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 225,641, Jan. 16, 1981, abandoned. This application Dec. 21, 1982, Ser. No. 451,991

Int. Cl.³ C25B *1/34, 13/04, 13/08*

U.S. Cl. 204—98 **82 Claims**

1. A membrane which is impermeable to hydraulic flow of liquid, which comprises at least two layers of fluorinated polymer which have —COOR or $—S_2W$ functional groups, where R is lower alkyl and W is F or Cl, adjacent said layers being in adherent contact with one another, and a web of support material embedded therein, there being at least a first said layer of polymer whose functional groups are —COOR functional groups and a second said layer of polymer whose functional groups are —COOR or $—SO_2W$ functional groups, each said polymer with —COOR groups having an equivalent weight of 770 to 1250, and any said polymer with $—SO_2W$ groups having an equivalent weight of 900 to 1400, the total thickness of said at least two layers of fluorinated polymer used in preparation of said membrane being in the range of about 50 to 250 microns, said web of support material having a thickness of about 25 to 125 microns and consisting of both reinforcing members and sacrificial members.

4,437,952

COEXTRUDED MULTILAYER CATION EXCHANGE MEMBRANES

Roger A. Smith, Kennett Square, and Michael S. Withers, Landenberg, both of Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 336,849, Jan. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 298,600, Sep. 2, 1981, abandoned, which is a continuation of Ser. No. 225,653, Jan. 16, 1981, abandoned. This application Oct. 25, 1982, Ser. No. 436,422

Int. Cl.³ C25B *1/34, 13/02*

U.S. Cl. 204—98 **23 Claims**

1. A process for the preparation of a multilayer cationic ion exchange membrane by heating at least two substantially incompatible melt-fabricable fluorinated polymers containing pendant side chains having functional groups selected from sulfonyl and carboxyl to a temperature above the melting point of the polymers, bringing the molten polymers into contact while each is at a temperature above the melting point of the polymer, coextruding the polymers into a composite film, cooling the resulting composite to a temperature below the melting points of each of the films, and subsequently converting the functional groups to ionizable functional groups.

4,437,953

PROCESS FOR SOLUTION CONTROL IN AN ELECTROLYTIC ZINC PLANT CIRCUIT

Oliver M. G. Newman, Moonah; David J. Palmer, Kingston Beach, and Robert V. Pammenter, Lindisfarne, all of Australia, assignors to Electrolytic Zinc Company of Australasia Limited, Melbourne, Australia

Filed May 18, 1982, Ser. No. 379,491

Int. Cl.³ C25C *1/16*

U.S. Cl. 204—119 **13 Claims**

1. In a process for controlling the water balance and the concentration of impurity (I) in an electrolytic zinc plant circuit in which zinc is precipitated from an aqueous solution (A) containing zinc sulphate using a compound (R) containing zinc oxide as the precipitant in a selective zinc precipitation (SZP) process plant, thereby producing precipitated solids (S) containing basic zinc sulphate and a zinc depleted solution (Y), the solids (S) being returned to the said circuit, and where the impurity I comprises at least one member of the group magnesium, manganese, chloride, sodium, and potassium, the improvement which comprises reducing the volume of zinc depleted solution Y returned daily to the said circuit in association with the solids S by using a compound R which has an average particle size in the range of 5 to 150 μm.

4,437,954

FUELS PRODUCTION BY PHOTOELECTROLYSIS OF WATER AND PHOTOOXIDATION OF SOLUBLE BIOMASS MATERIALS

Anthony F. Sammells, Naperville, and Michael R. St. John, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jun. 19, 1981, Ser. No. 275,378

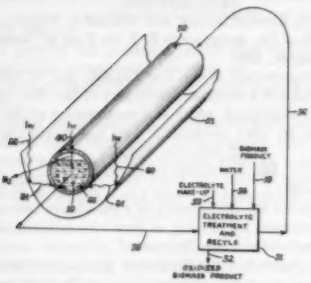
Int. Cl.³ C25B *1/04, 15/08;* **B01J** *19/08*

U.S. Cl. 204—129 **32 Claims**

1. A process for fuels production by photoelectrolysis of water and photooxidation of water soluble biomass product avoiding molecular oxygen evolution comprising:

passing an aqueous electrolyte comprising oxidizable biomass product selected from the group consisting of monosaccharides, polysaccharides, lignins, their partially oxidized products, and mixtures thereof in contact with both electrodes of a plurality of solid photochemical diodes of the type selected from the group consisting of Schottky-type metalized appro-

priately doped p-type semiconductor, Schottky-type metalized appropriately doped n-type semiconductors, appropriately doped p-n type semiconductors, and mixture thereof, said oxidizable biomass product oxidizing more cathodically than oxygen and having a decomposition potential more negative than said semiconductor;



optically illuminating said semiconductor portion(s) of said photochemical diodes producing hydrogen as the cathodic reaction of said photochemical diode and producing oxidized biomass product as the anodic reaction of said photochemical diode;

removing molecular hydrogen from said electrolyte; and

separately removing oxidized biomass product from said electrolyte.

4,437,955

COMBINED AC AND DC ETCHING OF ALUMINUM FOIL

Jesse S. Shaffer, Columbia, S.C., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,530

Int. Cl.³ C25F *3/04*

U.S. Cl. 204—129.4 **4 Claims**

1. A process for the electrolytic etching of aluminum capacitor foil comprising pre-etching said foil by immersing said foil in a first aqueous electrolyte bath containing, by weight, from 1–6% of HCl, 0–2% of H_3PO_4 and 0–2% of HNO_3 while being subjected to an AC of a current density of 0.1–2.0 amps/cm^2 and a frequency of 15–100 Hertz while said first electrolyte bath is maintained at a temperature of 30°–60° C. until a loss of weight of said foil of at least about 0.05 mg/cm^2 is achieved and then, without removing the HCl from said foil, etching said foil by immersing said foil in a second aqueous electrolyte bath containing, by weight, 18–26% of NaCl and either 0.3–2% of Na_2SO_4 or 1–4% of boric acid while being subjected to DC of a current density of 2–5 amps/cm^2 while said second electrolyte bath is maintained at a temperature of about 80°–100° C. until a total loss of weight of said foil of at least about 7 mg/cm^2 is achieved.

4,437,956

METHOD FOR PREPARING SURFACES OF METAL COMPOSITES HAVING A BRITTLE PHASE FOR PLATING

Cameron W. Coates, Knoxville, and Thomas J. Wilson, Clinton, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,799

Int. Cl.³ C23F *1/02*; C25F *3/08*; C25D *5/38*

U.S. Cl. 204—129.35 **4 Claims**

1. A method for preparing the surfaces of a two-phased metal composite for a plating with a corrosion-resistant material when the composite is formed of a relatively brittle refractory metal or carbide particulate component in a matrix of metal of greater malleability than the brittle metal or carbide component comprising the steps of selectively etching a major portion of the brittle component from the exposed surfaces of the composite, sufficiently peening the exposed surfaces of the composite to essentially deplete the latter of the brittle metal component and to spread the relatively malleable matrix metal on the exposed surfaces, and thereafter chemically removing residual particulates of the brittle component from the exposed surface so as to provide a surface on the composite consisting essentially of the malleable matrix metal for reception of an adherent plating of the corrosion resistant material.

4,437,957

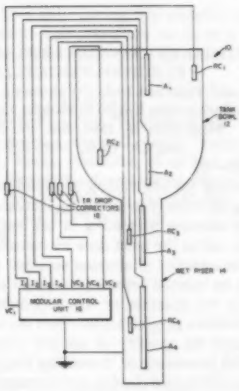
CATHODIC OR ANODIC PROTECTION SYSTEM AND METHOD FOR INDEPENDENTLY PROTECTING DIFFERENT REGIONS OF A STRUCTURE

Jonathan P. Freeman, Dorset, Ohio, assignor to Freeman Industries, Inc., Dorset, Ohio

Filed May 3, 1982, Ser. No. 374,298

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—147 **23 Claims**



1. A system for protecting a structure immersed in an electrolyte using at least two protection units located adjacent to different regions of the structure comprising:

a first protection unit comprising:

first means for applying a continuously adjustable rectified alternating current voltage between the structure and at least a first electrode which is immersed in the electrolyte and spaced apart from the structure;

a first reference cell located in the electrolyte to produce a direct current voltage between the first reference cell and the structure;

first measuring means coupled to the first reference cell to measure the potential between the first reference cell and the structure; and

first control means coupled between said first measuring means and said first applying means for continuously adjusting said first applying means to control the level of the rectified alternating current voltage applied by said first applying means in accordance with the level of the potential measured by said first measuring means; and

a second protection unit comprising:

second means for applying a continuously adjustable rectified alternating current voltage between the structure and at least a second electrode which is immersed in the electrolyte and spaced apart from the structure;

a second reference cell located in the electrolyte to produce a direct current voltage between the second reference cell and the structure;

second measuring means coupled to said second reference cell to measure the potential between said second reference cell and the structure; and

second control means coupled between said second measuring means and said second applying means for continuously adjusting said second applying means to control the level of the rectified alternating current voltage applied by said applying means in accordance with the level of potential measured by said second measuring means,

wherein the first and second protection units are essentially independent of one another in their operation and are located adjacent to different regions of the protected structure so that the level of alternating current voltage applied between the structure and the first electrode and the structure and the second electrode will be independently established by the first and second control means in accordance with the respective potentials measured by said first and second measuring means.

4,437,958

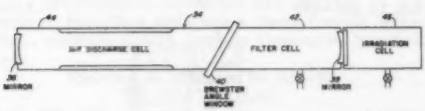
DEVICE AND METHOD FOR SEPARATING OXYGEN ISOTOPES

Stephen D. Rockwood, and Robert K. Sander, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,586

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R **17 Claims**



10. A method for separating isotopes of oxygen in oxygen gas, which comprises the steps of:

a. generating laser radiation at approximately 193 nm;

b. filtering said laser radiation, to produce interaction radiation approximately coincident with dissociative absorption bands of the oxygen isotope to be separated and preferentially absorbed thereby;

c. irradiating the oxygen gas with said interaction radiation to preferentially photodissociate oxygen molecules containing the oxygen isotope to be separated in the oxygen gas thereby producing oxygen atoms enriched in te oxygen isotope to be separated; and

d. combining said oxygen atoms with a scavenger to form a product separable from the oxygen gas and enriched in the oxygen isotope to be separated.

4,437,959

PHOTOPOLYMERIZABLE COMPOSITION BASED ON EPOXY COMPOUND

Shuzi Hayase, Kawasaki, and Shuichi Suzuki, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 421,733

Claims priority, application Japan, Sep. 30, 1981, 56-153746

Int. Cl.³ C08F *2/50*; C08G *59/68*

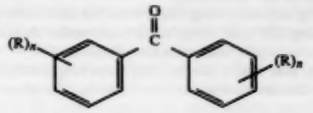
U.S. Cl. 204—159.11 **12 Claims**

1. A photopolymerizable composition comprising:

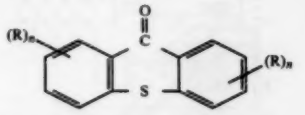
an epoxy compound;

a curing catalyst including at least one aluminum compound having at least one organic radical directly bonded to the aluminum atom, and at least one α-ketosilyl compound; and

at least one photosensitizer selected from the group consisting of benzophenone compounds represented by a formula:



(where each R is independently a halo group, an alkyl group, an aromatic group or a substituted aromatic group, an n is an integer from 0 to 5), and thioxanthone compounds represented by a formula:



(where R and n have the same meanings as above).

4,437,960

METHOD FOR THE CROSSLINKING OF CATHODICALLY DEPOSITABLE COATING AGENTS

Hans-Georg Zengel, Kleinwallstadt; Hilde Kersten, Erlenbach, and Helmut Mägerlein, Obernburg, all of Fed. Rep. of Germany, assignors to Akzo, N.V., Arnham, Netherlands

Filed Dec. 10, 1981, Ser. No. 329,562

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047525

Int. Cl.³ C25D *13/06, 13/10*

U.S. Cl. 204—181 C **16 Claims**

1. Method for the crosslinking of cathodically depositable coating agents, optionally containing pigment, dyestuff, filler, solvent, varnish adjuvant or additional crosslinking components, based upon a water-soluble or dispersible nitrogen based cationic resin, at least partially present as salt, comprising contacting a cationic resin having a molecular weight of at least 1000, containing 2 to 20 equivalents of double bonds per 1000 g with at least one member selected from the group consisting of sulfur, sulfur donor compounds and mixtures thereof as vulcanization accelerators, thereby obtaining a coating mixture, electrophoretically depositing said coating mixture onto an object, and hardening at temperatures above 120° C.

4,437,961

METHOD FOR SEQUENTIALLY PROCESSING A MULTI-LEVEL INTERCONNECT CIRCUIT IN A VACUUM CHAMBER

Donald E. Routh, and Gian C. Sharma, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 19, 1982, Ser. No. 409,679

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 EC **7 Claims**

1. A method for processing multi-level interconnections for microelectronic circuits comprising:

providing a processed wafer device having a first metal contact layer, an insulating layer over said metal contact layer, and a photo resist pattern applied over said insulating layer defining a via to be formed in a subsequent step;

providing a vacuum chamber;

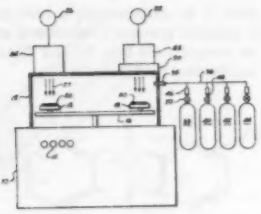
providing an RF sputtering means and DC mangetron sputtering means arranged in operable position for sputtering in said vacuum chamber;

placing said processed wafer device in said chamber and sequentially performing the following steps in said vacuum chamber without exposure to the atmosphere;

forming said via by etching through said insulating layer of the wafer device according to said photo resist pattern by means of RF sputtering;

removing any remaining photo resist on said wafer device by utilizing RF sputtering while said wafer device remains continuously in said vacuum chamber;

cleaning said wafer device and removing remaining oxide from the wafer device after removing the photo resist by



sputtering said wafer device with said RF sputtering means while said wafer device is continously processed in said vacuum chamber; and

depositing a layer of interconnect material on the wafer device in place while continuously in said vacuum chamber by means of magnetron sputtering, thereby filling said via to make electrical connection with said metal contact layer.

4,437,962

DIAMONDLIKE FLAKE COMPOSITES

Bruce A. Banks, Olmsted Township, Cuyahoga County, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 17, 1983, Ser. No. 495,381

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **18 Claims**

1. A method of making a composite material comprising the steps of

depositing carbon on a surface,

removing flakes of said carbon from said surface, and

mixing said flakes with a matrix material to form the composite material.

4,437,963

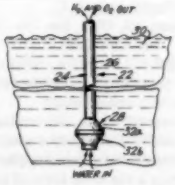
APPARATUS FOR ELECTROLYZING WATER

David R. Yeoman, 869 Concourse Village West, Bronx, N.Y. 10451

Filed Sep. 10, 1981, Ser. No. 300,812

Int. Cl.³ C25B *1/04, 15/08*; F03B *13/10, 13/12*

U.S. Cl. 204—229 **10 Claims**



1. Apparatus for the electrolysis of water, comprising:

an elongated tube;

an electrolysis assembly provided at one end of said tube defining an interior chamber constituting an extension of said tube, said electrolysis assembly including,

at least one fixed stator and at least one rotatably mounted rotor,

drive means for rotating the rotor adapted to be driven by a flowing fluid,

a pair of fixed electrodes extending across said interior chamber,

a matrix of modules, each module comprising bistable magnetic means having a reversing polarity when exposed to an increasing magnetic field and having respective positive and negative leads, affixed to one of said rotor and stator and magnetic field generating means provided on the other of said rotor and stator, and

circuit means coupling said positive and negative leads of said modules to respective ones of said electrodes;

whereby upon a fluid being caused to flow through said interior chamber, said drive means effect rotation, of said rotor with respect to said stator whereupon said modules are exposed to continuous excursions in magnetic field strength to generate a voltage which is impressed across said electrodes to electrolyze water coming into contact with the same.

4,437,964

ASSEMBLY FOR SPOT FEEDING ALUMINA TO AN ELECTROLYTIC TANK FOR THE PRODUCTION OF ALUMINUM

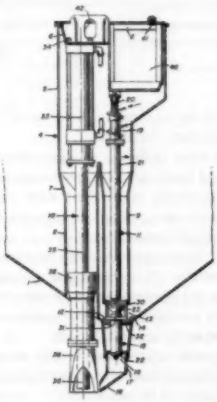
Jean-Louis Gerphagnon, and Claude Wolter, both of St. Jean De Maurienne, France, assignors to Aluminium Pechiney, St. Jean de Maurienne, France

Filed May 19, 1983, Ser. No. 496,244

Claims priority, application France, May 27, 1982, 82 09700

Int. Cl.³ C25C *3/14, 3/22*

U.S. Cl. 204—245 **4 Claims**



4. A system for spot feeding alumina into a tank for producing aluminum by electrolysis of alumina dissolved in molten cryolite, comprising; a hopper over the tank, crust breaking means for making a hole in the crust of solidified electrolyte, which covers the surface of the tank in normal operation, and alumina feed control means for feeding controlled doses of alumina into the hole, said hopper having a bottom aperture for discharge of the alumina, an impervious case positioned vertically in said hopper, said case having an open upper end substantially at the level of the upper portion of the hopper, said case, in spaced relation below the open upper end, having two substantially parallel depending branches, a first branch downwardly opening outside the hopper, and the second branch opening inside the hopper, in the immediate vicinity of the aperture for the discharge of alumina, the crust breaking means being positioned detachably in the first branch of the case, and the alumina feed means being positioned detachably in the

second branch of the case, and a support overlying and generally sealing the open upper end of the case, the crust breaking means and the alumina feed means being fixed to said support with the support being common to the feed means and the crust breaking means, said support, feed means, and crust breaking means being removable from the hopper as a unit.

4,437,965

REINFORCED LEAD ANODE FOR THE ELECTROLYTIC PRODUCTION OF ZINC FROM SULPHATE SOLUTION AND PROCESS FOR THE PREPARATION THEREOF

Noël Dreulle; Alain Van Ceulen, and Claude Eusebe, all of Douai, France, assignors to Compagnie Royale Asturienne des Mines, Brussels, Belgium

Filed Mar. 11, 1982, Ser. No. 357,195
Claims priority, application France, Mar. 18, 1981, 81 05396
Int. Cl.³ C25B *11/00*
U.S. Cl. 204—290 F **7 Claims**

1. In a lead anode for producing zinc from aqueous solutions of zinc sulphate, the improvement wherein said lead anode comprises a thin, generally flat reinforcing member and an active part comprising argentiferous lead coated on said reinforcing member, said reinforcing member being made of a metal selected from the group consisting of titanium and zirconium, and said argentiferous lead coating comprising a layer on each side of said reinforcing member, the two layers being joined along their peripheral edges and the total thickness of the two layers being greater than the thickness of said reinforcing member.

4,437,966

SPUTTERING CATHODE APPARATUS

Lawrence L. Hope, Stow, and Ernest A. Davey, Peabody, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 431,958
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **5 Claims**

1. In a sputtering cathode apparatus for the deposition of a thin film on a substrate which is moved relative to the apparatus and including planar sputtering means and means for exciting the planar sputtering means, the improvement comprising a sputtering cathode target associated with said sputtering means, said target having a predetermined plasma sputtering area in the form of a closed convoluted electron path defining a target area larger than the planar area of the substrate, said substrate motion being confined to an area within said defined target area, and said predetermined plasma sputtering area including multiple plasma legs separated by non-emissive regions therebetween.

4,437,967

APPARATUS FOR ELECTROPHORETICALLY FRACTIONATING A SOLUTION

Victor Sanchez, Ramonville-Saint-Agne; Patrick Espenan, Toulouse; Ernest Casademont, Montgiscard, and J. Pierre Lafaille, Saint-Orens, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Nov. 9, 1981, Ser. No. 319,408
Claims priority, application France, Nov. 7, 1980, 80 23952
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—301 **10 Claims**

1. An electrophoretic fractionating apparatus for separating solutions containing dissolved substances, in particular solutions containing proteins, comprising:

(a) a frame;

(b) first and second opposed electrodes mounted to said frame and extending therefrom and including means for generating an electric field between said electrodes;

(c) first and second opposed semi-permeable membranes, each of said membranes being adjacent one of said electrodes;

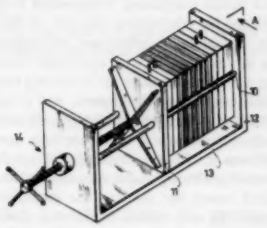
(d) a fractionating chamber having first and second parallel surfaces and being of a pre-determined thickness positioned between said membranes;

(e) solution intake means associated with said chamber;

(f) solution evacuation means associated with said chamber and at a distance from said intake means;

(g) said fractionating chamber including a plurality of spaced parallel strips for dividing said chamber into a plurality of compartments of substantially equal volume, said strips having a thickness equal to said chamber thickness adapted for maintaining said membranes said predetermined thickness apart;

(h) said solution intake means including a first compartment



associated with said first surface and having a depth less than said chamber thickness and spanning said plurality of said strips for distributing said solution to said compartments;

(i) said solution evacuation means including a second compartment associated with said second surface and having a depth less than said chamber thickness and spanning said plurality of said strips for evacuating said solution; and,

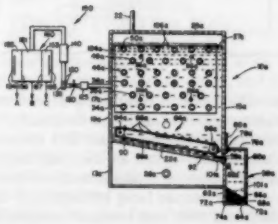
(j) said chamber having partition elements located on one hand along one side of said chamber to separate said intake means from said evaucation means and on the other hand along the opposite side for the purpose of bounding the evacuation means in the vicinity of the first membrane.

4,437,968

BOILER APPARATUS

Robert H. Elliott, Jr., Fort Washington, Pa., assignor to Zerpol Corporation, Fort Washington, Pa.

Continuation-in-part of Ser. No. 185,850, Sep. 10, 1980, which is a division of Ser. No. 65,816, Aug. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 907,190, May 18, 1978, abandoned. This application Dec. 10, 1981, Ser. No. 329,514
Int. Cl.³ B01D *13/02*; C02F *1/02*
U.S. Cl. 204—301 **1 Claim**



1. Apparatus for use in treatment of wastewater effluent from an industrial process wherein a steam component, a useful industrial chemical, and a treated water stream having a low concentration of impurities is generated from wastewater fed to said apparatus, comprising: boiler means for receiving and heating said wastewater under pressure to produce an impure concentrate and a steam component, said impure concentrate

comprising a boiler dissolved solids containing component substantially free of suspended solids and a boiler sludge component containing suspended solids; bolwdown means having first means communicating with said boiler means for removing said sludge component, said blowdown means further including means for removing said sludge from said first means; and second means for removing said dissolved solids containing component from said boiler means and for treating said dissolved solids containing component to form said treated water stream and a useful industrial chemical wherein said second means further includes (A) controller means for measuring the conductivity of said dissolved solids containing component and in response to said conductivity withdrawing said dissolved solids containing component from said boiler means, (B) means for controlling the rate of flow of said dissolved solids containing component withdrawn from said boiler means in response to said controller means, (C) third means having a central chamber for receiving said flow of said dissolved solids containing component, end chambers defined by ion-permeable membranes separating said central chamber from said end chambers, said end chambers containing electrodes, and means for flowing a direct current from the electrodes transversely through said membranes and said chambers, said third means for diluting the concentration of said component entering said central chamber to form said treated water stream and for forming an industrial chemical in said end chambers, (D) means for introducing said dissolved solids containing component into said central chamber and (E) means for removing said treated water stream from said central chamber and said industrial chemical from said end chambers.

4,437,969

OFFSET-GATE CHEMICAL-SENSITIVE FIELD-EFFECT TRANSISTORS (OG-CHEMFETS) WITH ELECTROLYTICALLY-PROGRAMMABLE SELECTIVITY

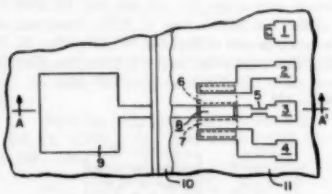
Arthur K. Covington, Newcastle upon Tyne, and Alastair Sibbald, Whitley Bay, both of England, assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,721

Claims priority, application United Kingdom, Apr. 9, 1981, 8111198

Int. Cl.³ C12Q *1/00*; G01N *27/46*

U.S. Cl. 204—403 **8 Claims**



7. A field-effect device comprising a semiconductor substrate, a source region located in a first surface of said substrate, a drain region located in said first surface and spaced apart from said source region, an electrical insulator material overlying at least a portion of said source and drain regions and the surface of the substrate lying between said regions, a gate conductor disposed over said insulator material between said source and drain regions, said gate conductor extending laterally along said first surface to a region remote from said source and drain regions, the width of that portion of said gate conductor in said remote region being greater than the width of said gate conductor in the region of said source and drain regions, at least a portion of said lateral extension of said gate conductor being covered by at least one electroactive material suitable for the detection and measurement of chemical properties to which the device is exposed, an electrical conductor connected to said conductive layer, and a fusible link connected in series with said electrical conductor.

4,437,970

DEVICE FOR DETERMINING IONIC ACTIVITY

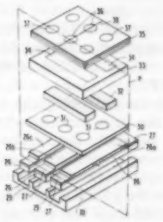
Masao Kitajima; Osamu Seshimoto; Kikuo Kubotera, and Akira Yamaguchi, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 2, 1983, Ser. No. 500,600

Claims priority, application Japan, Jun. 2, 1982, 57-94575

Int. Cl.³ G01N *27/46, 27/58*

U.S. Cl. 204—412 **19 Claims**



1. In a device for determining ionic activity composed of plural pairs of solid electrodes each pair having an ion-selective layer selectively responsive to a specific predetermined ion as the outermost layer of the solid electrodes and one porous bridge formed thereon for achieving, after supplying a test solution and a reference solution to said pairs of solid electrodes, the electrical conduction between both electrodes in each said pair by the permeation of the solutions through the porous bridge, the improvement comprising said plural pairs of solid electrodes, each electrode pair having one electrode on each of two sides and having a different ion-selective layer, at least one liquid distribution porous member provided for each said side of plural pairs of solid electrodes so that said liquid distribution porous member covers at least partially all the electrodes at each said side, and said bridge disposed on or between said liquid distribution members.

4,437,971

ELECTROCHEMICAL OXYGEN SENSOR, PARTICULARLY FOR EXHAUST GASES FROM COMBUSTION ENGINES

Herbert Csanitz, Bietigheim-Bissingen, and Helmut Weyl, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,518

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023337

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—427 **14 Claims**

1. In combination with an exhaust system of an internal combustion engine having an exhaust component (E) subject to vibration,

an electrochemical sensor to determine the oxygen content of gases, particularly of exhaust gases from an internal combustion engine, said sensor having

a body (11) of solid electrolyte material;

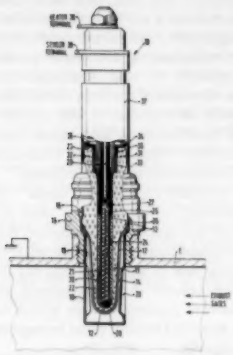
a layer-like porous measuring electrode (14) applied to a first surface region of the body;

means including another surface region of the body defining a hollow chamber (21);

a layer-like reference electrode (22) located on said other surface region of the body and positioned within the hollow chamber (21), said hollow chamber being open to ambient air, the oxygen of which providing a reference gas;

and comprising

movable granules (39) loosely retained and located in at least part of said hollow chamber (21) in which the layer-like reference electrode (22) is located, said granules being



inert with respect to oxygen and having a surface hardness which is at least as great as that of the layer-like reference electrode (22).

4,437,972

PROCESS FOR CO-PROCESSING COAL AND A PARAFFINIC MATERIAL

Francis J. Derbyshire, Ewing, N.J., and Philip Varghese, Newtown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,438
Int. Cl.³ C10G *1/00, 1/06, 3/00*
U.S. Cl. 208—8 LE 21 Claims

1. A process for treating a mixture comprising coal and a paraffinic feedstock, said process comprising: thermally reacting said mixture in a thermal reaction zone to form an effluent comprising a solids fraction, a polar asphaltenic liquid fraction derived substantially from said coal and a paraffinic liquid fraction, said paraffinic liquid fraction containing a sufficient paraffin content derived from said feedstock to promote separation of said polar asphaltenic fraction from said paraffin liquid fraction, cooling said effluent to precipitate said polar asphaltenic fraction and separating said solids fraction and precipitated polar asphaltenic fraction from said paraffinic liquid fraction.

4,437,973

COAL HYDROGENATION PROCESS WITH DIRECT COAL FEED AND IMPROVED RESIDUUM CONVERSION

Derk T. A. Huibers, Pennington, and Paul H. Kydd, Lawrenceville, both of N.J., assignors to HRI, Inc., Gibbsboro, N.J.

Filed Apr. 5, 1982, Ser. No. 365,660
Int. Cl.³ C10G *1/08*
U.S. Cl. 208—10 23 Claims

1. A process for hydrogenation of coal to produce hydrocarbon liquid and gaseous products, comprising:

(a) pressurizing particulate coal which has been dried to a moisture content of less than about 5 W % and feeding it at temperature below about 600° F. directly, without further heating into a pressurized backmixed type reaction zone containing coal-derived liquid and hydrogen;

(b) passing the coal along with said coal-derived liquid and hydrogen upwardly through said reaction zone which is maintained at 700°–975° F. temperature and 1000–5000 psig hydrogen partial pressure to rapidly heat the cool and convert it to hydrogenated coal-derived material;

(c) heating recycle hydrogen and a recycle coal-derived hydrogen liquid normally boiling above about 550° F. to a temperature sufficient to maintain said reaction zone temperature and recycling the heated materials into the lower part of said reaction zone to maintain said temperature therein;

(d) withdrawing said hydrogen coal-derived material containing gas and liquid fractions from the upper part of said reaction zone, and phase separating said material into gaseous and liquid fractions;

(e) passing said liquid fraction from said phase separation to a liquid-solids separation step, from which an overhead liquid stream normally boiling above about 550° F. and containing a reduced concentration of particulate solids is heated to said temperature above the reaction zone before recycling said heated coal-derived liquid into the reaction zone; and

(f) recovering hydrocarbon gas and increased yield of low boiling hydrocarbon liquid product from the process.

4,437,974

COAL LIQUEFACTION PROCESS

Ryohei Minami, Chiba; Shozo Okamura; Yoshihiko Sunami, both of Ibaraki; Takuji Hosoi, Kawasaki, and Takuo Kanou, Tokyo, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 17, 1982, Ser. No. 389,566
Claims priority, application Japan, Jun. 29, 1981, 56-99647
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 17 Claims

1. A coal liquefaction process comprising a coal liquefaction step to contact finely divided coal with molecular hydrogen and a solvent in the presence of a catalyst to provide a slurry, and a separation step to separate the resulting slurry into a gaseous component, a liquid component and a solid residue, characterized by further comprising a metal bath gasification step to gasify a carbonaceous solid material by blowing an oxygen gas and said solid residue onto a molten metal bath through a non-immersing lance, and with fine powdery solids which are derived from the molten metal bath and recovered from the generated gas in said metal bath gasification step being introduced to said liquefaction step and used as said catalyst.

4,437,975

MANUFACTURE OF LUBE BASE STOCK OIL

Bernard M. Gillespie, Pitman; Michael S. Sarli, Haddonfield, and Kenneth W. Smith, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 74,361, Sep. 10, 1979, abandoned, which is a division of Ser. No. 862,460, Dec. 20, 1977, Pat. No. 4,181,598, which is a continuation-in-part of Ser. No. 817,309, Jul. 20, 1977, Pat. No. 4,137,148. This application Sep. 30, 1982, Ser. No. 430,180
Int. Cl.³ C10G *47/16, 65/12*
U.S. Cl. 208—87 4 Claims

1. In a process for preparing a lube base stock oil from a deasphalted short residuum of a waxy crude, said deasphalted short residuum having a pour point substantially higher than +30° F., said process comprising dewaxing said deasphalted short residuum and recovering a dewaxed residuum having a pour point from about −25° F. to not higher than +30° F., the improvement, whereby increasing the yield of said dewaxed residuum, which comprises:

catalytically dewaxing said deasphalted short residuum by contact, in the presence of hydrogen, with a dewaxing catalyst contained in a dewaxing zone, said dewaxing catalyst comprising an aluminosilicate zeolite having a silica/alumina ratio of at least about 12 and a Constraint Index of about 1 to about 12, said contacting being at a temperature from 500° to about 675° F. and at a hydrogn partial pressure at the reactor inlet of about 150–1500 psia, and cascading the effluent from said dewaxing zone to a hydrotreating zone wherein it is contacted with a hydro-

treating catalyst at a temperature of 500° to 575° F., thereby increasing the oxidation stability of said dewaxed residuum.

4,437,976
TWO-STAGE HYDROCARBON DEWAXING HYDROTREATING PROCESS

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 290,759, Aug. 7, 1981. This application Sep. 13, 1982, Ser. No. 417,765
Int. Cl.³ C10G *65/02, 45/12*
U.S. Cl. 208—97 **10 Claims**

1. A process for catalytically dewaxing and hydrotreating a waxy hydrocarbon fraction boiling within the approximate range of 400° to 1050° F. to provide a lubricating oil of high viscosity index which comprises:

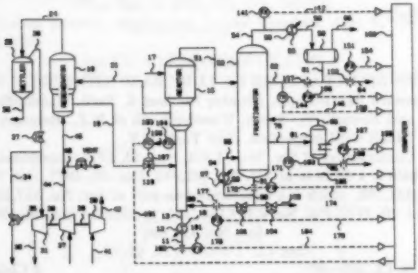
(a) contacting said fraction with a dewaxing catalyst under conditions sufficient to effect at least a partial dewaxing of said fraction; and

(b) contacting the reaction product thereby obtained with hydrogen and a hydrotreating catalyst comprising one or more zeolites selected from the group consisting of ZSM-5, ZSM-11, ZSM-23, and ZSM-35, blended with a refractory inorganic oxide to form an extrudate, said extrudate having a metal hydrogenation component present therein in a concentration of metal in elemental, oxide, or sulfide form of between about 0.05 and about 25 percent by weight and a concentration of zeolite in said extrudate of between about 5 and about 40 percent by weight.

4,437,977
CONTROL OF A CATALYTIC CRACKING UNIT

Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1982, Ser. No. 427,260
Int. Cl.³ B01J *8/26*; C10G *11/18*
U.S. Cl. 208—113 **16 Claims**



1. Apparatus comprising:

a reactor;

a fractional distillation column;

means for supplying a feed to said reactor;

means for removing the products produced by the cracking of said feed from said reactor and for supply the thus removed products as a feed to said fractional distillation column;

cooling means;

an accumulator;

means for withdrawing an overhead stream from said fractional distillation column and for supplying the thus withdrawn overhead stream through said cooling means to said accumulator;

means for withdrawing a liquid stream from said overhead accumulator, for returning a first portion of the thus withdrawn liquid stream to an upper portion of said fractional distillation column as an upper external reflux and for withdrawing a second portion of the thus withdrawn liquid stream as an overhead product stream;

means for withdrawing a sidedraw stream from an intermediate portion of said fractional distillation column, wherein at least a portion of said sidedraw stream is utilized to provide a side draw product stream;

means for withdrawing a bottoms product stream from a lower portion of said fractional distillation column, wherein a portion of the thus withdrawn bottoms product stream may be recycled to said reactor;

means for establishing a first signal representative of the actual internal reflux to vapor ratio in said upper portion of said fractional distillation column;

means for establishing a second signal representative of the actual internal reflux to vapor ratio in said intermediate portion of said fractional distillation column;

means for establishing a third signal representative of the actual flow rate of product removed from said fractional distillation column in said overhead product stream and said sidedraw product stream which has a boiling point above a specified boiling point in response to said first and second signals;

means for establishing a fourth signal representative of the actual flow rate of said bottoms product stream;

means for summing said third signal and said fourth signal to establish a fifth signal representative of the total flow rate of product withdrawn from said fractional distillation column which has a boiling point above said specified boiling point;

means for establishing a sixth signal representative of the flow rate of the portion of said feedstream to said reactor which has a boiling point above said specified boiling point;

means for establishing a seventh signal representative of the flow rate of any portion of said bottoms product stream recycled to said reactor;

means for summing said sixth signal and said seventh signal to establish an eighth signal representative of the total flow rate of feed to said reactor which has a boiling point above said specified boiling point;

means for establishing a ninth signal representative of the amount of the feed flowing to said reactor which has a boiling point above said specified boiling point which is converted to a product having a boiling point below said specified boiling point (Conversion) in response to said fifth and eighth signals;

means for establishing a tenth signal representative of a desired Conversion;

means for comparing said ninth signal and said tenth signal and for establishing a eleventh signal which is responsive to the difference between said ninth signal and said tenth signal; and

means for manipulating a process variable associated with said reactor in response to said eleventh signal to thereby maintain the actual Conversion represented by said ninth signal substantially equal to the desired Conversion represented by said tenth signal.

4,437,978
CRACKING CATALYST COMPOSITIONS FOR REDUCTION OF SULFUR CONTENT IN COKE

Arthur W. Chester, Cherry Hill; Harry A. McVeigh, Belle Mead, and William A. Stover, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 945,967, Sep. 26, 1978. This application May 3, 1982, Ser. No. 374,454
Int. Cl.³ B01J *29/10*; C10G *11/05, 47/18*
U.S. Cl. 208—120 **9 Claims**

1. A cyclic fluidized catalytic cracking process, characterized by reduced emissions of sulfur oxides in regenerator stack gases, wherein a hydrocarbon feedstock containing organic

sulfur compounds is subjected to cracking under fluidizing conditions with a high-activity fluid cracking catalyst in a reaction zone, cracking catalyst deactivated by coke deposits is separated from cracked hydrocarbon reaction zone effluent and regenerated to high activity in a catalyst regeneration zone by burning the coke deposits from the fluid catalyst in contact with an oxygen-containing gas stream, and regenerated fluid catalyst is recycled to the reaction zone, said process comprising the cracking of the hydrocarbon feedstock containing organic sulfur compounds in the presence of a regenerable fluid cracking catalyst, said cracking catalyst comprising a base cracking catalyst comprising a rare earth exchanged zeolite Y contained in a matrix therefor, co-impregnated with rare earth oxides, and a metal selected from chromium, manganese, cobalt, nickel and platinum group metals, said rare earth oxides being present in amounts between about 1 and 10 wt percent above the exchange capacity of said base material, said chromium, manganese, cobalt and nickel components being present in amounts between about 0.05 and 5 wt percent as the oxides, and said platinum group metals in amounts between about 0.1 and 200 ppm of metal.

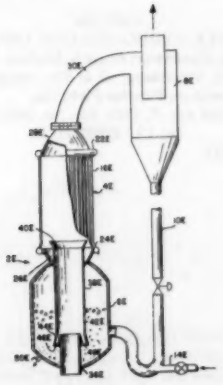
4,437,979
SOLIDS QUENCH BOILER AND PROCESS

Herman N. Woebcke, Stamford, Conn.; Arju H. Bhojwani, Lawrenceville, N.J., and Robert J. Gartside, Auburndale, Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Division of Ser. No. 165,784, Jul. 3, 1980, Pat. No. 4,356,151, which is a continuation-in-part of Ser. No. 82,162, Oct. 5, 1979, Pat. No. 4,351,275. This application Feb. 2, 1982, Ser. No. 345,099

Int. Cl.³ C10G *9/32*

U.S. Cl. 208—153 **5 Claims**



1. In a TRC process wherein hydrocarbon feed of hydrosulfurization residual oil, together with entrained inert solids and diluent gas, are passed through a cracking zone within a thermal cracking reactor for a residence time of 0.05 to 2 seconds to produce a stream of reactor effluent, wherein the temperature in said cracking zone is between 1300° F. and 2500° F., and after which said reactor effluent is quench cooled, the improvement comprising a process for sequentially quenching the reactor effluent including the steps of:

a. introducing particulate solids into the effluent stream in the first quenching zone to partially quench the effluent;

b. passing the composite stream of partially quenched effluent and particulate solids in indirect heat exchange relationship with a coolant in the second quenching zone to further cool the composite stream of effluent and particulate solids;

c. separating the quenched and cooled gas from the particulate solids after the effluent and particulate solids have passed in indirect heat exchange relationship with the coolant; and

d. returning the separated particulate solids for reintroduction to the effluent stream leaving the reactor.

4,437,980
MOLTEN SALT HYDROTREATMENT PROCESS

Laszlo A. Heredy, Canoga Park, and Raymund P. Skowronski, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 30, 1982, Ser. No. 403,693

Int. Cl.³ C10G *49/02*; B01J *23/92*

U.S. Cl. 208—235 **8 Claims**

1. A hydrotreating process for sulfur, asphaltene and metal removal from a carbonaceous material which comprises:

(1) introducing a carbonaceous material and an organic hydrogen donor solvent into a mixing zone;

(2) introducing the resulting solution of carbonaceous material in organic hydrogen donor solvent into a reaction zone containing a molten medium comprising potassium hydroxide and water, said water being present in an amount of about 16–33 wt. % based on the combined weight of said potassium hydroxide and water, said potassium hydroxide and water being present in a combined amount of about 50–300 wt. % based on the weight of said carbonaceous material;

(3) introducing hydrogen into said reaction zone in an amount sufficient to provide a pressure in said reaction zone within the range of about 10 to 300 atmospheres;

(4) reacting said carbonaceous material and hydrogen at a temperature in the range of about 350°–550° C. for a period of time of about 1 minute to 2 hours;

(5) recovering desulfurized, deasphalted and demetallized hydrotreated products comprising about 90–98 wt. % of liquid hydrocarbonaceous products having a sulfur content reduced by at least about 80% from the sulfur content of said carbonaceous material, an asphaltene content reduced by at least about 60% from the asphaltene content of said carbonaceous material, a metals content reduced by at least about 90% from the metals content of said carbonaceous material, and less than about 1 wt. % of gaseous hydrocarbonaceous products;

(6) separating from said liquid hydrocarbonaceous products an organic hydrogen donor solvent;

(7) recycling said organic hydrogen donor solvent to said mixing zone;

(8) removing from said reaction zone a portion of spent molten medium;

(9) adding water to the removed portion of spent molten medium to form an aqueous slurry of solids comprising potassium sulfide, heavy metal salts, ash and solid organic matter in a concentrated aqueous potassium hydroxide solution containing about 34–50 wt. % water;

(10) separating said solids from said concentrated aqueous potassium hydroxide solution;

(11) treating said solids with water to dissolve said potassium sulfide and to leave undissolved heavy metal salts, ash and solid organic matter;

(12) separating said undissolved heavy metal salts, ash and solid organic matter from the aqueous solution resulting from dissolving said potassium sulfide to form a clarified aqueous solution of potassium sulfide;

(13) carbonating said clarified aqueous solution of potassium sulfide to remove hydrogen sulfide therefrom and to produce a carbonated solution comprising potassium carbonate;

(14) reacting said carbonated solution with calcium hydroxide to precipitate calcium carbonate and regenerate an aqueous solution of potassium hydroxide;

(15) separating said calcium carbonate from said aqueous potassium hydroxide solution;

(16) partially dehydrating both said concentrated aqueous potassium hydroxide solution from step (10) and said

aqueous potassium hydroxide solution from step (15) to provide a potassium hydroxide solution containing about 16–33 wt. % water; and

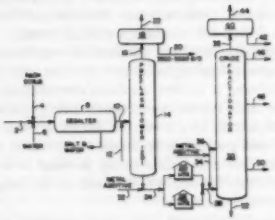
(17) recycling said potassium hydroxide solution containing about 16–33 wt. % water to said reaction zone.

4,437,981

IMMOBILIZATION AND NEUTRALIZATION OF CONTAMINANTS IN CRUDE OIL

Stephen M. Kovach, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 22, 1982, Ser. No. 443,413
Int. Cl.³ C10G *29/04, 29/06*
U.S. Cl. 208—253 **13 Claims**



1. A method for deactivating alkaline contaminants and metal contaminants in crude oils prior to affecting catalytic conversion of fractions thereof which comprises:

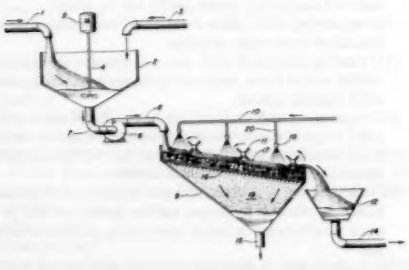
contacting a crude oil with one or more metal compounds selected from the group consisting of titanium, zirconium, and indium compounds immediately prior to or during distillation thereof, whereby residual alkaline material in said crude oil is neutralized and vanadium is reacted to form a reaction product having a melting point above the maximum temperature of a downstream catalytic conversion operation, and recovering a residual fraction of said crude oil boiling above 32.2° c. (630° F.) comprising metal contaminants reduced in deactivating affect upon a downstream contacted zeolite conversion catalyst at an elevated temperature.

4,437,982

SEPARATION OF CLAY FROM COAL

George E. Wasson, Eighty Four, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Aug. 9, 1982, Ser. No. 406,151
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—5 **14 Claims**



1. A method of separating refuse from a mixture of fine coal particles and refuse particles comprising the steps of:

(a) providing a coarse coal filter cake means having an upper surface,

(b) forming a solids-liquid mixture comprising a solids mixture of fine coal particles, and inorganic solid refuse particles in a liquid mixture comprising water and petroleum oil,

(c) conveying said solids-liquid mixture onto said upper surface of said coarse coal filter cake to form a layer of fine coal and refuse above said coarse coal filter cake,

(d) spraying water from water spray means onto said fine coal-refuse layer,

whereby a major portion of said water and a major portion of said refuse pass through said coarse coal filter cake means and a major portion of said petroleum oil and a major portion of said fine coal particles remain above said filter cake means and recovering the fine coal.

4,437,983

FROTH FLOTATION METHOD FOR RECOVERING ZIRCONIUM MINERALS

Vojislav Petrovich, 1935 W. Schiller St., Chicago, Ill. 60622

Filed Sep. 9, 1982, Ser. No. 416,285
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 **2 Claims**

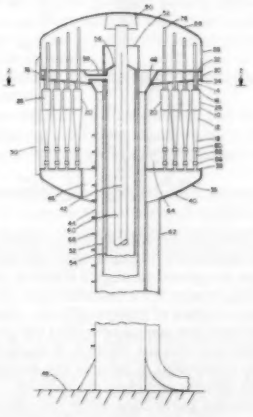
1. In concentrating by froth flotation of zirconium ores, which includes the subjecting of said ore material when finely ground to froth flotation process in the presence of alkylaryl and aryl glycolic acid or its sodium salt promoter-collector; the step of adding to the mineral slurry an amount of the order from 0.05 to 0.5 kg per ton of ore treated of said alkylaryl or aryl glycolic acid sodium salt; said addition to aqueous dispersion of ore produce a froth flotation product of zirconium mineral value by continuing agitation and aeration of the aqueous dispersion of ore, and separating and recovering the zirconium mineral value as float froth concentrate product.

4,437,984

MULTIPLE HYDROCYCLONE APPARATUS

Stephen J. King, Clearwater; Bruce S. Moffatt, Largo, and John C. Stewart, St. Petersburg, all of Fla., assignors to Clark & Vicario Corporation, Pinellas Park, Fla.

Filed Apr. 5, 1982, Ser. No. 365,773
Int. Cl.³ B03D *45/12*
U.S. Cl. 209—211 **27 Claims**



1. Multiple hydrocyclone apparatus of the type having:

(a) a plurality of elongated, vertically extensive hydrocyclones disposed side by side in a plurality of loop-like arrays, said plurality of arrays including an innermost array and at least one outer array surrounding said innermost array;

(b) means for conducting feed stock to the inlets of said hydrocyclones;

(c) means for conducting rejected stock from the reject outlets of said hydrocyclones, such means including a reject manifold disposed below said hydrocyclones; and

(d) means for conducting accepted stock from the accept outlets of said hydrocyclones, such means including an accept plenum disposed above said hydrocyclones, means for maintaining a partial vacuum within said accept plenum, means for spraying accepted stock from the accept outlets of said hydrocyclones into said accept plenum and an accept outlet pipe communicating with said accept plenum and extending downwardly therefrom in the space bounded by the innermost one of said arrays of hydrocyclones;

wherein the improvement comprises disposition of said innermost array and said accept outlet pipe to provide a clearance between such pipe and the hydrocyclones of said innermost array so that said accept outlet pipe and said innermost row of hydrocyclones cooperatively define a walkway space of sufficient size to accommodate a humahn operator and means for permitting entry of a human operator to said walkway space during operation of the hydrocyclones without removal of any of said hydrocyclones, said accept outlet pipe including an outwardly flaring transition section adjacent said accept plenum, the wide end of said transition section being disposed at the top thereof, said transition section extending outwardly of said accept outlet pipe above said walkway space.

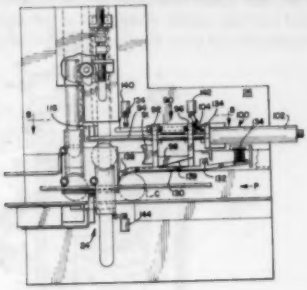
4,437,985

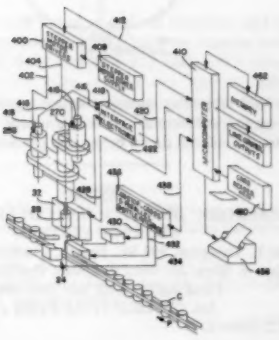
CONTAINER DEFECT MONITORING SYSTEM

James J. Hinds, LeGrange; John C. Hoeflich, and George C. Kolodziej, both of Oak Park, all of Ill., assignors to National Can Corporation, Chicago, Ill.

Filed May 18, 1981, Ser. No. 264,798
Int. Cl.³ B07C *5/02, 5/342*
U.S. Cl. 209—538 **22 Claims**

1. A monitoring device for inspecting the condition of the surface of articles moving along a path comprising a color monitor positioned adjacent said path, first means for removing an article from said path, second means for positioning said article into general alignment with said color monitor, third means for indexing a preselected point of said surface with respect to said color monitor, said color monitor producing a signal indicative of the condition of said surface at said preselected point, and ejector means for ejecting said article when said signal is outside preselected limits, said first and second means cooperating to return said article to said path when said signal is within said preselected limits, and said first means returning said article to said path and thereafter removing another article from said path, said first means including first and second members reciprocable transversely of said path, means between said members for moving said members in





opposite directions with respect to each other, and drive means for reciprocating said members.

4,437,986

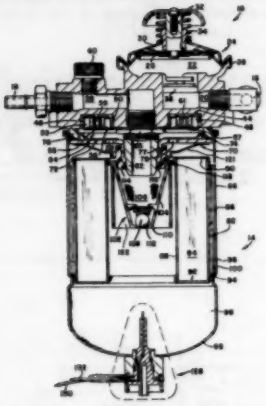
SEPARATING DEVICE AND CARTRIDGE THEREFOR

Charles K. Hutchins; Donald I. Thornton, and Richard H. Peyton, all of East Providence, R.I., assignors to Fram Corporation, East Providence, R.I.

Filed Sep. 22, 1982, Ser. No. 421,613
Int. Cl.³ B01D *27/10*
U.S. Cl. 210—130 **13 Claims**

1. Separator cartridge for separating immiscible components of a liquid mixture comprising a casing having inlet and outlet connections adapted for communication to a liquid flow system, an annular coalescing medium within said casing for causing the liquid component to be separated from said mixture to agglomerate into liquid droplets, said coalescing medium having inner and outer surfaces, a sump defined within said casing for collecting the liquid to be separated from the liquid mixture, means in said casing for deflecting liquid flow through said inlet connection to the outer surface of said coalescing medium, a separating medium coaxial with said coalescing medium and located downstream of the latter so that the liquid mixture flows through the coalescing medium before reaching the separating medium, said liquid mixture flowing from the inner surface of said coalescing medium to said separating medium while allowing at least some of the coalesced liquid droplets of the liquid to be removed from said mixture to deposit in said sump, the surface of said separating medium being a material repellant to the liquid to be removed from said mixture so that droplets of the liquid to be removed deposit on said surface and fall into said sump while the other liquid of

said liquid mixture passes therethrough, and pressure differential responsive means opening to permit said liquid mixture to bypass said separating medium when pressure differential



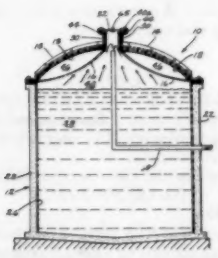
across said separating medium attains a predetermined level, said pressure differential responsive means closing when the pressure differential drops below the predetermined level.

4,437,987

ANAEROBIC DIGESTER GAS COLLECTION AND STORAGE SYSTEMS

Marvin L. Thornton, 509 SE. Fourth, Ankeny, Iowa 50021, and Arthur J. Boyt, Jr., 4602 Kingman, Des Moines, Iowa 50311

Filed Jul. 1, 1982, Ser. No. 394,405
Int. Cl.³ C02F *11/04*; C12M *1/02*
U.S. Cl. 210—137 **6 Claims**



1. In an anaerobic sludge digester storage container having a wall communicating with a floor forming a storage container for holding sludge with a fixed outer cover overlying the storage tank, the tank having a sludge inlet and outlet with a center stack communicating with the storage container therebelow, the improvement comprising:

a flexible gas membrane means extending between the wall and the center stack and over and above the storage container, in a configuration forming a gas tight seal between the sludge and the outer cover from the wall to the center stack of the outer cover, forming a gas chamber;

a pressurizing membrane means extending over the top of the gas membrane means and between the gas membrane means and the outer cover extending between the wall and the center stack, for creating an inner pressurizing chamber between the top surface of the gas membrane means and the bottom surface of said pressurizing membrane means, said two membranes being sealingly attached to the top of the wall at their bottom portion and the center stack at their upper portion;

a pressure differential sensor means for monitoring the air pressure within the inner pressurizing chamber and the gas pressure within the gas chamber;

an air injection means operated by the pressure differential sensor means for injection of pressurized air into the inner pressurizing chamber between the gas membrane and the pressurizing membrane causing the controlled expansion of the inner chamber via the downward movement of the gas membrane means toward the sludge within the storage container to maintain and regulate the pressure of the gas at a predetermined level produced by the anaerobic process and collecting between the top of the sludge and the bottom of the gas membrane;

gas exhaust means for removing the gas stored in the gas chamber, the exhaust means communicating with the gas chamber and the outside of the storage container; and

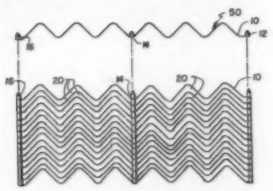
a bleed-off valve communicating with the inner chamber for permitting air to flow from the inner chamber to the outside of the digester.

4,437,988

PLATE SEPARATOR CONSTRUCTION AND METHOD

William James, 1483 Pine Knoll La., Mamaroneck, N.Y. 10543

Division of Ser. No. 289,152, Aug. 3, 1981, Pat. No. 4,337,561.
This application Feb. 18, 1982, Ser. No. 349,971
Int. Cl.³ C02F *1/40*; B01D *21/00*
U.S. Cl. 210—237 **8 Claims**



1. A liquid separator and plate stack combination comprising:

a housing having opposite side walls spaced from each other by a selected distance;

a stack of a plurality of spaced corrugated and interconnected plates defining tortuous paths therebetween and made of resilient material;

said stack having an undistorted stack length and stack width, with one of said stack length and stack width being substantially similar to said selected distance between said housing side walls;

said stack having one of a distorted stack length and distorted stack width respectively so that said stack is insertable between said housing side walls

said stack with undistorted side length and side width provided between said housing side walls and closely associated with each side wall by the resiliency of said plate material; and

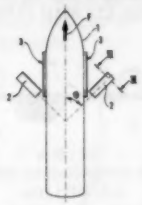
suspension means engaged with said stack for supporting said stack in such a way to produce said at least one of a distorted stack length and distorted stack width.

4,437,989

APPARATUS FOR COLLECTING SUBSTANCES FLOATING ON AN EXPANSE OF LIQUID

Bernard Valibouse, Grenoble; Albert Bonazzi, Gieres, both of France, assignors to Societe Anonyme dite: Alsthom-Atlantique, Paris, France

Filed Nov. 9, 1981, Ser. No. 319,762
Claims priority, application France, May 30, 1980, 80 12062
Int. Cl.³ B01D *23/00*
U.S. Cl. 210—242.3 **5 Claims**



1. An apparatus for removing and collecting a light liquid from a water surface and being borne by a ship hull moving through the water, said apparatus comprising:

a long narrow separator plate mounted to the outside of the ship hull, separate therefrom and extending lengthwise away from the ship hull and forming an acute angle θ forwardly in the direction of ship movement with the centerline of the ship hull, said separator plate being partially submerged widthwise within the water,

a collector trough being mounted against the side of the ship's hull abovethe surface of the water laterally spaced inboard of said separator plate and ahead of the rear end of said separator plate for collecting said light liquid separated from the water surface, said collector trough communicating with a chamber internally of said ship's hull.

and wherein said partially submerged separator plate is inclined downwardly and rearwardly widthwise relative to the direction of hull movement at an acute angle α such that at a relatively fast hull speed, the light liquid rebounds against the bottom of the separator plate and is thrown forwardly and sidewise into the air toward the side of the ship hull and above the collector trough for separation from the water and collection thereby.

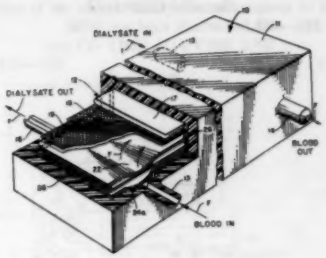
4,437,990

SEMIPERMEABLE MEMBRANE MASS TRANSFER APPARATUS HAVING SLOTTED SUPPORT MEMBERS

Alexander S. Borsanyi, Newport Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 44,072, May 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 779,577, Mar. 21, 1977, abandoned. This application Dec. 18, 1981, Ser. No. 332,324
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.3 **4 Claims**

1. A mass transfer apparatus for use in hemodialysis and ultrafiltration comprising a housing; a semi-permeable membrane disposed within said housing; said membrane being folded to form a stack of accordion pleats and being so constructed and arranged that two separate fluid chambers for blood and dialysate are thereby formed with said dialysate chamber being on one side of said membrane and said blood chamber on the other; ports provided by said housing for directing the flow of blood and dialysate into and out of the respective chambers; and a plurality of discrete planar support members of open-mesh plastic material associated with said membrane; said discrete support members each being flat and unfolded, of generally rectangular outline, and of substantially the same size, and being arranged to provide a pair of said members in superimposed contiguous relation within each pleat only on the dialysate side of said membrane, and being absent from the pleats on the blood side of said membrane; one support member of each contiguous pair being provided with at least one transverse slot which extends the full thickness of said one support member and in which the plastic material of said one support member is completely absent; said slot being in substantial alignment with one of said ports for directing the



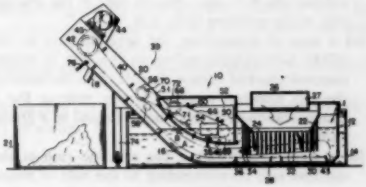
flow of blood into and out of said blood chamber; said transverse slot extending from an edge of said one support member facing towards said blood flow directing ports and terminating short of the opposite edge of said one support member, whereby, the portions of said one support member bordering said slot remains structurally integrated with each other.

4,437,991

FILTER APPARATUS

Minoru Tashiro, Tokyo, Japan, assignor to Bunri Industry Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1982, Ser. No. 371,270
Claims priority, application Japan, Apr. 28, 1981, 56-64726
Int. Cl.³ B01D *25/38*
U.S. Cl. 210—413 **23 Claims**



1. A filter apparatus for filtering a liquid containing solid materials comprising:

a filter member made of a flexible sheet having a number of though holes which prevent passage of solid materials while allow passage of the liquid thereby filtering the liquid;

at least one wiper which has an oil-resistant material plate and is slidably arranged over the surface of the filter member on the liquid inlet side to scrape off the solid materials deposited on the surface of the filter member upon sliding movement thereof;

at least one second wiper which has two oil-resistant material plates and is slidably arranged over the surface of the filter member on the liquid outlet side; and

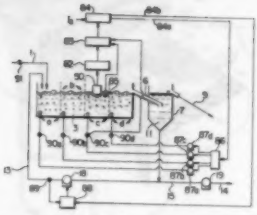
driving means for sliding the first and second wipers over the surfaces of the filter member at the same speed and in the same direction so that the first and second wipers sandwich the filter member on both its sides and the first wiper is interposed between the oil-resistant material plates of the second wiper.

4,437,992

PROCESS FOR CONTROLLING AN AERATION TANK IN AN ACTIVATED SLUDGE SEWAGE TREATMENT

Yukio Saito; Shunsuke Nogita; Syoji Watanabe, and Kenji Baba, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 149,995, May 15, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,110
Claims priority, application Japan, May 16, 1979, 54-59153
Int. Cl.³ C02F 3/12
U.S. Cl. 210—603 7 Claims



1. A process for controlling an aeration tank in an apparatus for sewage treatment by activated sludge which apparatus includes an aeration tank for stirring and mixing inflow sewage with activated sludge and a gas containing oxygen, a sedimentation tank for settling a mixed liquor from the aeration tank, thereby concentrating and separating sludges converted by assimilating action of microorganisms upon organic matter in the sewage, a gas blowing means for supplying the gas containing oxygen into the aeration tank, and a sludge return means for returning the sludge concentrated and separated in the sedimentation tank to the aeration tank, said process comprising the following steps:

(a) a step of measuring a concentration of carbon dioxide of an effluent gas from the aeration tank at the sewage inflow side of the aeration tank,

(b) a step of measuring a concentration of nitrous oxide of an effluent gas from the aeration tank at the sewage outflow side of the aeration tank, and

(c) a step of controlling the aeration rate at the sewage inflow side corresponding to the side of measuring the concentration of carbon dioxide from the aeration tank by the gas blowing means, thereby making the measured concentration of carbon dioxide equal to a predetermined value and

(d) a step of controlling the aeration rate at the sewage outflow side corresponding to the side of measuring the concentration of nitrous oxide from the aeration tank by the gas blowing means, thereby making the measured concentration of nitrous oxide equal to a predetermined value.

4,437,993

PREVENTION OF PENETRATION OF OILY HYDROCARBONS INTO SAND

Walter Lindorfer, Kassel; Fritz Wagner, Stockheim, and Walther Schulz, Vechta, all of Fed. Rep. of Germany, assignors to Wintershall AG, Kassel and Gesellschaft fur Biotechnologische Forschung mbH, Brunswick, both of, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 303,996
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1980, 3035685
Int. Cl.³ E02B 15/04
U.S. Cl. 210—631 16 Claims

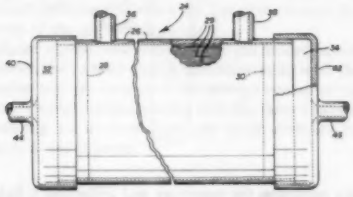
1. A method for preventing the penetration of an oily hydrocarbon composition into dry or moist sand comprising the step of spraying the sand with a thin layer of an aqueous solution or dispersion of glycolipids, whose hydrophilic component comprises a dicarbohydrate, prior to contact of the hydrocarbon composition with the sand.

4,437,994

EXTRACTION OF METAL IONS FROM AQUEOUS SOLUTION

Richard W. Baker, Bend, Oreg., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 890,149, Mar. 27, 1978, abandoned. This application Aug. 14, 1980, Ser. No. 177,976
Int. Cl.³ B01D 13/00
U.S. Cl. 210—638 10 Claims



1. A process for extraction of selected ions of metals from an aqueous feed solution and deposition of said ions in an aqueous product solution comprising:

circulating said feed solution into the lumens of a multiplicity of hollow fibers, the walls of said fibers consisting essentially of a microporous anisotropic membrane having pores of about 0.01 to 0.04 micron in diameter at each surface and pores of about 2 to 10 microns in diameter in the interior, and said membrane having a water-immiscible organic liquid comprising a complexing agent specific for said ions substantially completely filling, and retained within, the pores thereof, and

circulating said aqueous product solution over the outer sides of said fibers,

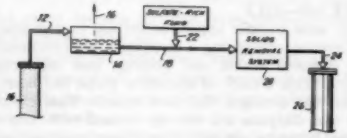
whereby a complex is formed between said complexing agent and said ions in the feed solution followed by diffusion of said complex through the organic liquid in the pores of the membrane, and subsequent liberation of said ions in the product solution.

4,437,995

TREATMENT OF GEOTHERMAL BRINE SULFATE-RICH FLUIDS TO FACILITATE THE PRECIPITATION OF SILICA

Robert W. Rex, La Habra, Calif., assignor to Republic Geothermal, Inc., Santa Fe Springs, Calif.

Filed Mar. 23, 1983, Ser. No. 477,954
Int. Cl.³ C02F 1/52
U.S. Cl. 210—714 9 Claims



1. A method for controlling the precipitation of silica from geothermal brine supersaturated with silica comprising the steps of: adding into said brine a liquid rich in sulfate ion and thereby forming, by reaction of said sulfate-rich liquid and salts contained within said brine, a fine, metal sulfate colloidal suspension containing adsorbed silica solids; and separating said suspension and adsorbed silica solids from said brine.

4,437,996

PROCESS FOR TREATING CYANIC LIQUID CONTAINING COPPER(I) CYANIDE COMPLEX ION

Michihide Okugawa, Nishinomiya, Japan, assignor to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Filed Nov. 19, 1982, Ser. No. 442,915
Claims priority, application Japan, Nov. 27, 1981, 56-191318
Int. Cl.³ C02F 1/58
U.S. Cl. 210—718 9 Claims

1. A process for treating a cyanic liquid containing copper(I) cyanide complex ion which comprises heating the liquid at a temperature of not lower than 200° C. in the presence of a water-soluble metal hydroxide.

4,437,997

CLARIFICATION OF AMMONIUM POLYPHOSPHATE SOLUTIONS

Alan M. Dobry, Chicago, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 251,294, Apr. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 950,974, Oct. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 781,625, Mar. 28, 1977, abandoned. This application Jun. 14, 1982, Ser. No. 387,824
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.
Int. Cl.³ B01D 21/01
U.S. Cl. 210—727 11 Claims

1. A process for the removal of suspended carbonaceous material from an aqueous ammonium polyphosphate solution wherein (i) said solution contains from about 10 to about 90% by weight of the total P_2O_5 in a polyphosphate form, (ii) said solution has a pH above about 4.5, (iii) said solution is prepared by the molecular dehydration and subsequent or concurrent ammoniation of wet-process phosphoric acid, (iv) said solution ranges in grade from about 8-27-0 to about 13-37-0, and (v) said carbonaceous material results from organic impurities in said wet-process phosphoric acid which char during said molecular dehydration, which process comprises the steps of:

(a) mixing said ammonium polyphosphate solution with an aqueous solution of a cationic terpolymer of about 75 mole % of acrylamide, about 25 mole % of diallyldi(2-hydroxyethyl)ammonium chloride, and a small amount of dimethyldiallylammonium chloride, said terpolymer having a molecular weight in excess of about 10,000, and wherein the amount of said terpolymer is effective to promote the flocculation of said carbonaceous material and said mixing is carried out at a temperature in the range from about 35° to about 200° F.;

(b) holding the resulting mixture at a temperature in the range from about 35° to about 200° F. for a period of time effective to permit the separation of said mixture into an upper layer of flocculated carbonaceous material and a lower layer of clarified ammonium polyphosphate solution; and

(c) separating said lower layer of clarified ammonium polyphosphate solution from said upper layer of flocculated carbonaceous material.

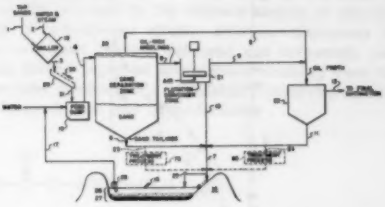
7. The process as set forth in claim 1 wherein an aqueous solution of at least one anionic polymer selected from the group consisting of anionic, water soluble organic polymers, is additionally added to said mixture of ammonium polyphosphate solution and aqueous cationic terpolymer solution, wherein the amount of said anionic polymer is from about 0.001 to about 0.1% by weight based on the weight of said ammonium polyphosphate solution, and wherein said anionic polymer is added to the ammonium polyphosphate solution subsequent to the addition of said cationic terpolymer.

4,437,998

METHOD FOR TREATING OIL SANDS EXTRACTION PLANT TAILINGS

Raymond N. Yong, Beaconsfield, Canada, assignor to Suncor, Inc., Toronto, Canada

Filed Apr. 23, 1982, Ser. No. 371,083
Claims priority, application Canada, May 19, 1981, 377832
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ C02F 1/54; C08L 3/02
U.S. Cl. 210—728 12 Claims



1. A process for achieving an internally surcharged sludge layer in a fines-containing body of water comprising the steps of:

(A) partially-treating any fines-containing aqueous material to be discharged into said body of water by mixing into the aqueous material 25–75 ppm of a hydrolyzed starch additive, which additive is obtained by the aqueous hydrolysis of the starch in the presence of one or more metal salts;

(B) depositing the partially-treated aqueous material resulting from step (A) into a holding/settling pond having a sufficient volume to provide a residence period for the partially-treated aqueous material within the range of six months to two years;

(C) withdrawing sludge from beneath a clarified water layer in said holding/settling pond and mixing into said sludge 25–175 ppm of the hydrolyzed starch additive;

(D) admixing sand into the mixture resulting from step (C); and

(E) discharging the mixture resulting from step (D) into the body of water.

4,437,999

METHOD OF TREATING CONTAMINATED INSOLUBLE ORGANIC SOLID MATERIAL

Sherman T. Mayne, Goldhill, N.C., assignor to Gram Research & Development Co., Charlotte, N.C.

Filed Aug. 31, 1981, Ser. No. 297,849
Int. Cl.³ C02F 1/32
U.S. Cl. 210—748 19 Claims

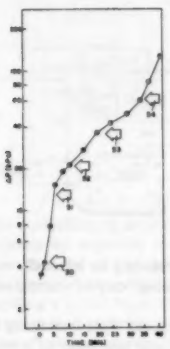
1. A method of treating insoluble organic solid resin material, that contains a contaminating material, to oxidize said organic material and isolate said contaminating material, comprising feeding said contaminated insoluble organic solid material into a body of water, simultaneously applying ultraviolet light and ozone to said water while agitating said water to distribute said ozone therein, continuing said applying of ultraviolet light and ozone while agitating said body of water for sufficient time to oxidize said organic material substantially into water and carbon dioxide, thereby leaving said contaminating material as either soluble material in solution in said water or as precipitated insoluble material or as both.

4,438,000

METHOD OF FILTRATION USING SEMIFLUIDIZED BEDS

Liang-tseng Fan, Manhattan, Kans., and Edward H. Hsu, Houston, Tex., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Aug. 10, 1982, Ser. No. 405,612
Int. Cl.³ B01D 23/10
U.S. Cl. 210—786 10 Claims



1. The method of filtering particulate solids from a fine solids-containing fluid flowing upwardly through a semifluidization filtration chamber having a porous fluid distributor across the lower portion thereof, a porous medium retainer across its upper portion, and a semifluidized body of filtration medium captivated therebetween, said medium during the filtration being in the form of an upper packed section extending downwardly from said retainer and a fluidized section from the bottom of said packed section to said distributor, the bottom surface of said packed section providing an interface with said fluidized section, wherein the improvement comprises:

(a) in a first phase of a filtration cycle providing a packed section of at least sufficient downward extend to prevent breakthrough of the filtered solids as they are removed from said fluid by the packed section with concentration of the removed solids adjacent the interface between the packed and fluidized sections;

(b) continuing said filtration in said first phase without appreciably increasing the percent of said medium in said packed section until a filter cake of removed solids has accumulated across the packed section interface, said solids accumulation having taken place while the upward velocity varied between opposite adjacent wall portions of said packed section interface, said accumulated filter cake in one area adjacent a wall portion of said chamber containing a larger accumulation of solids than in an other area of thereof adjacent an opposed wall portion of said chamber so that upward fluid flow is diverted from said one area to said other area; and

(c) in a second phase continuing said filtration with the fluid flow predominately through said other area to deposit additional medium together with filtered solids beneath said other area with a progressive increase in the downward extend of said packed section along said opposed wall portion, said second phase being continued until at least the major part of the total medium is in said packed section, said first and second phases being carried out without changing the position of said medium retainer within said filtration chamber.

4,438,001

OILING AGENT FOR TREATING SYNTHETIC FIBERS

Akira Suzuki, and Fumitoshi Sugiura, both of Gamagorishi, Japan, assignors to Takemotoyushi Co. Ltd., Aichi, Japan

PCT No. PCT/JP81/00082, § 371 Date Dec. 3, 1982, § 102(e) Date Dec. 3, 1982
PCT Filed Apr. 8, 1981, Ser. No. 448,911
Int. Cl.³ D06M 13/18, 13/30, 13/38, 00/00
U.S. Cl. 252—8.7 16 Claims

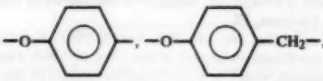
1. An oiling agent for treating synthetic fibers which comprises

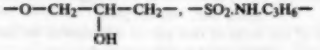
(I) 0.05 to 5% by weight of one kind or two kinds or more of fluorine-containing ionic surfactants expressed by the following general formula:

$$C_nF_{2n\pm1}—A—B$$

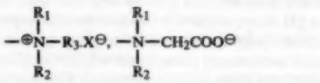
wherein

A: a group selected from the group of $—CF_2—$, $—O—(CH_2)_m—$ (m: integer of 1–3),





B: $—SO_3M^1$ (l/k), $—COOM^2$,
k: number of valency of metal M^1
M^1: Na, K, Ca, Mg, Ba
M^2: Na, K



R_1–R_3: alkyl of 1–20 carbon atoms
X: Cl, Br, I, R_4SO_4
R_4: CH_3 or C_2H_5
n: integer of 4–14;

(II) 30 to 99.95% by weight of a poly(oxyethylene-oxypropylene) ether derivative having a molecular weight of 1,000 to 10,000, obtained by adding ethylene oxide and propylene oxide to a monohydric or polyhydric alcohol of 1 to 20 carbon atoms;

(III) 0 to 30% by weight of a nonionic surfactant; and

(IV) 0 to 40% by weight of a mineral oil having a viscosity at 30° C. of 5 to 30 cst or a fatty acid ester having a molecular weight of 300 to 700 or mixtures thereof.

4,438,002

SURFACTANT FLOODING SOLUTION

Vernon H. Schievelbein, Houston, and Paul Zabczuk, Dallas, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 20, 1982, Ser. No. 420,430
Int. Cl.³ C07C 143/00; B01F 3/00; E21B 43/16
U.S. Cl. 252—8.55 D 8 Claims

1. An aqueous treating solution for injection into an underground hydrocarbon formation to increase hydrocarbon recovery, comprising:

about 80% to about 99% by weight of water disposable in the formation;

about 40% to about 85% of total solute by weight of petroleum sulfonate surfactant disposed in the water;

about 10% to about 40% of total solute by weight of a solubilizer compound disposed in the water, said solubilizer selected from the group consisting of alkylpolyalkoxyalkyl sulfate alkylpolyalkoxyalkyl sulfonate, alkylaryl-

polyalkoxyalkyl sulfate and alkyarylpolyalkoxyalkyl sulfonate; and

about 1% to about 35% of total solute by weight of dicyclopentadiene sulfonate disposed in the water.

4,438,003

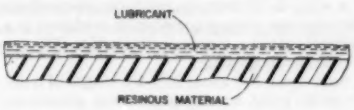
SKATING SURFACE

Elmer O. Nathaniel, 9178 Villaridge, St. Louis, Mo. 63123, and John Eibert, Jr., 1076 Humber Cir., St. Louis, Mo. 63129

Continuation of Ser. No. 850,953, Nov. 14, 1977, which is a continuation of Ser. No. 751,607, Dec. 17, 1976, abandoned, which is a continuation of Ser. No. 652,802, Jan. 27, 1976, abandoned, which is a continuation of Ser. No. 508,985, Sep. 25, 1974, abandoned. This application Aug. 21, 1978, Ser. No. 935,485

Int. Cl.³ C10M *7/14*

U.S. Cl. 252—12 **1 Claim**



1. A flat non-refrigerated surface-forming member for ice skating purposes formed of resinous material in the class consisting of high density polyethylene, polypropylene and fluorinated polyethylene, and a lubricant provided upon said member and forming a film thereon, said lubricant being a solution consisting essentially of approximately three parts by volume of water and approximately one part by volume of a water soluble agent from the class consisting of glycerin, ethylene glycol, butylene glycol, propylene glycol, diethylene glycol, trimethylene glycol, tetramethylene glycol, and pentamethylene glycol.

4,438,004

FUSED METALLIC FRICTION MATERIALS

Paul A. Myers, Crawfordsville, Ind., assignor to Raymark Industries, Inc., Trumbull, Conn.

Filed Dec. 6, 1982, Ser. No. 447,149

Int. Cl.³ C10M *7/04, 7/26, 7/52*

U.S. Cl. 252—12 **29 Claims**

1. A method for making friction material members comprising the steps of:

preparing a mixture of sinterable metal particles, carbonaceous material and curable polymeric resin, the mixture comprising at least about 50 percent by weight of sinterable metal particles and sufficient curable polymeric resin to coat and bond the metal particles and carbonaceous material;

placing the mixture in a mold;

curing the resin to form the mixture into a piece in a solid preformed shape corresponding to the shape of the mold; and thereafter

heating the preformed piece sufficiently to carbonize the resin and fuse the metal particles into a sintered metal matrix.

4,438,005

MARINE DIESEL ENGINE LUBRICANT OF IMPROVED SPREADABILITY

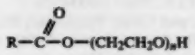
Benjamin H. Zoleski, Beacon, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 224,414, Jan. 12, 1981, abandoned. This application Dec. 17, 1982, Ser. No. 450,606

Int. Cl.³ C10M *1/40*

U.S. Cl. 252—33.4 **3 Claims**

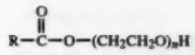
1. In a process for improving the spreadability of a diesel engine cylinder lubricant comprising an oil having an SAE viscosity of 50 and having a total base number ranging from about 50 to 100 provided by the presence therein of effective amounts of conventional alkaline detergent dispersants, the improvement consisting of blending with said lubricant a spreadability improving amount of at least one polyoxyethylene ester of the formula:



$$R-C(=O)-O-(CH_2CH_2O)_nH$$

wherein R is an alkyl group having from 11 to 17 carbon atoms and n is 18 to 22, said ester having a molecular weight ranging from 1000 to 1200.

3. A diesel engine lubricant comprising an oil having an SAE viscosity of 50 and a total base number ranging from about 50 to about 100 provided by the presence therein of effective amounts of conventional alkaline detergents-dispersants including overbased calcium sulfonates and carbonates, said lubricant having improved spreadability resulting from the incorporation therewith of a spreadability improving amount of a polyoxyethylene ester of the formula:



$$R-C(=O)-O-(CH_2CH_2O)_nH$$

wherein R is an alkyl group having 17 carbon atoms, n is 20 and said ester has a molecular weight in the range of 1100 to 1170.

4,438,006

PERFLUORINATED ALIPHATIC POLYALKYLETHER LUBRICANT WITH AN ADDITIVE COMPOSED OF AN AROMATIC PHOSPHINE SUBSTITUTED WITH PERFLUOROALKYLETHER GROUPS

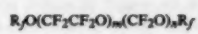
Carl E. Snyder, Jr., Trotwood, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 14, 1982, Ser. No. 418,113

Int. Cl.³ C10M *1/10*

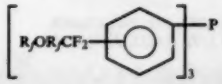
U.S. Cl. 252—49.9 **10 Claims**

1. A lubricant composition comprising (1) a base fluid consisting essentially of a mixture of linear fluorinated polyethers having the formula



$$R_fO(CF_2CF_2O)_m(CF_2O)_nR_f$$

wherein R_f is CF_3 or C_2F_5, m and n are integers whose sum is between 2 and 200 and the ratio of m to n is between 0.1 and 10; and (2) a corrosion inhibiting amount of an aromatic phosphine with perfluorinated polyalkylether substituents having the formula



wherein R_fOR_f— is a perfluoroalkylether group containing at least one ether linkage.

4,438,007

PERFLUORINATED ALIPHATIC POLYALKYLETHER LUBRICANT WITH AN ADDITIVE COMPOSED OF AN AROMATIC PHOSPHINE SUBSTITUTED WITH PERFLUOROALKYLETHER GROUPS

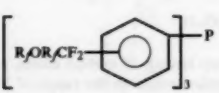
Carl E. Snyder, Jr., Trotwood, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 14, 1982, Ser. No. 418,116
Int. Cl.³ C10M 1/10
U.S. Cl. 252—49.9 10 Claims

1. A lubricant composition comprising (1) a base fluid consisting essentially of a mixture of linear fluorinated polyethers having the formula

$$C_3F_7[CF(CF_3)CF_2O]_nCF_2CF_3$$

wherein n is an integer having a value of 5 to 50 and (2) a corrosion inhibiting amount of an aromatic phosphine with perfluorinated polyalkylether substituents having the formula



wherein R_fOR_f— is a perfluoroalkylether group containing at least one ether linkage.

4,438,008

LUBRICANT, CONTAINING ESTERIFIED ETHYLENE/ACRYLIC ACID OR ETHYLENE/MALEIC ACID COPOLYMERS AS THE ACTIVE INGREDIENT, FOR MOULDING CHLORINE-CONTAINING THERMOPLASTICS

Dieter Oeder, Weisenheim; Walter Ziegler, Edingen; Manfred Daeuble; Wolfram Dietsche, both of Frankenthal; Albert Hettche, Hessheim, and Stefan Weiss, Neckargemuend, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,276
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107245
Int. Cl.³ C10M 3/12
U.S. Cl. 252—56 R 6 Claims

1. A lubricant for molding chlorine-containing thermoplastics and combined in an amount of 0.1 to 5 phr with said chlorine-containing thermoplastic, which contains ethylene/acrylic acid or ethylene/maleic acid copolymers esterified, in a molar ratio of carboxyl groups to alcoholic hydroxyl groups of from 1:0.2 to 1:1, with C_1–C_{20}-aliphatic alcohols which may or may not contain ether groups, the copolymers, prior to esterification, having a mean molecular weight of from 500 to 10,000 and containing from 2 to 15% by weight of acrylic acid or from 1 to 8% by weight of maleic acid as copolymerized units, the percentages being based on copolymer.

4,438,009

LOW SOLVENT LAUNDRY PRE-SPOTTING COMPOSITION

Jeanne A. Brusky, and Rodney W. Schrader, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Aug. 14, 1981, Ser. No. 293,049
Int. Cl.³ C11D 1/72, 1/825, 3/04, 3/42
U.S. Cl. 252—90 16 Claims

1. A water-in-oil detergent emulsion to be applied to fabrics as a laundry pre-spotting composition comprising:

(a) from about 1 to about 30% by weight of a salt selected from the group consisting of citrates, gluconates, borates, silicates, phosphates, chlorides, carbonates and mixtures thereof;

(b) from about 1 to about 35% by weight of a surfactant mixture of (i) about 0.5 to about 5% by weight of a sorbitan nonionic surfactant selected from the group consisting of sorbitan monolaurate, sorbitan monooleate, sorbitan trioleate and mixtures thereof; (ii) from about 0.5 to about 30% of at least one other nonionic surfactant; and (iii) from about 0.5 to 3.0% by weight, of an ethoxylated sorbitan nonionic surfactant, said mixture having an HLB of from 8.5 to 10.5;

(c) from about 5 to about 60% by weight of a solvent selected from the group consisting of isoparaffinic hydrocarbons having a boiling range of from 98°–210° C., low odor petroleum solvents having a boiling range of from 195°–250° C., kerosene, d-Limonene and mixtures thereof; and

(d) the balance water.

16. A water-in-oil detergent emulsion to be applied to fabrics as a laundry pre-spotting composition contained in a pressurized aerosol container comprising from 95 to 80% by weight of a composition comprising:

(a) from about 1 to about 30% by weight of a salt selected from the group consisting of citrates, gluconates, borates, silicates, phosphates, chlorides, carbonates and mixtures thereof;

(c) from about 1 to about 35% by weight of a surfactant mixture of (i) about 0.5 to about 5% by weight of a sorbitan nonionic surfactant selected from the group consisting of sorbitan monolaurate, sorbitan monooleate, sorbitan trioleate and mixtures thereof; and (ii) from about 0.5 to about 30% of at least one other nonionic surfactant, said mixture having an HLB of from 8.5 to 10.5;

(c) from about 5 to about 60% by weight of a solvent selected from the group consisting of isoparaffinic hydrocarbons having a boiling range of from 98°–210° C., low odor petroleum solvents having a boiling range of from 195°–250° C., kerosene, d-Limonene and mixtures thereof; and

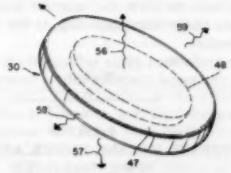
(d) the balance water and from 5 to 20% by weight of a propellent.

4,438,010

SOAP TABLET INCLUDING PERFUME-CONTAINING PLASTIC CORE AND PROCESS FOR PREPARING SAME

Jerome I. Lindauer, Hillsdale; Ira D. Hill, Locust, and Arthur L. Liberman, Highlands, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,263
Int. Cl.³ C11D 3/50, 9/44
U.S. Cl. 252—91 2 Claims



1. A detergent bar comprising:

(i) an aromatized plastic core comprising a polymer in the solid phase and imbedded in said polymer an aromatizing agent which is compatible with said polymer;

(ii) surrounding said plastic core and in intimate contact with the surface area of said plastic core, and adhering to said plastic core, a detergent composition existing in the solid phase, said detergent composition having a defined outer surface;

the quantity of aromatizing agent within the plastic core, the

physical properties of the plastic core, and the physical properties of the detergent composition surrounding the plastic core being such that the aromatizing agent is transported at a steady state from the plastic core into said detergent composition past the outer surface of said detergent composition and into the environment surrounding said detergent bar, said aromatizing agent being compatible with said detergent composition, said detergent bar being produced by the process consisting essentially of the steps of:

(a) forming a thermoplastic polymeric pellet having imbedded therein aromatizing agent;

(b) Collecting a plurality of said aromatized polymeric pellets and forming the plurality of aromatized thermoplastic polymeric pellets into an aromatized thermoplastic core by means of fusion of the plurality of pellets in a mold; and

(c) propelling a detergent composition in the fluid state in such a manner as to cause said detergent to surround the aromatized plastic core; and

(d) causing the detergent composition surrounding the aromatized thermoplastic polymeric core to harden.

4,438,011

METHOD FOR STERILIZING SOFT CONTACT LENS

John G. B. Howes, Hertford Heath, England, assignor to Smith and Nephew Associated Companies Limited, England

Filed Nov. 12, 1981, Ser. No. 320,710

Claims priority, application United Kingdom, Dec. 18, 1980, 8040532

Int. Cl.³ C11D *1/84, 3/48*

U.S. Cl. 252—106 **10 Claims**

1. A method of sterilizing a soft contact lens, which comprises contacting said lens for sufficient time to effect sterilization with a substantially isotonic, aqueous solution having small or no propensity to cause ocular irritation, said solution comprising a sterile aqueous solution of 0.00125 to 0.0025% of a chlorhexidine salt and sufficient nonionic tonicity adjusting agent to render the solution substantially isotonic, said tonicity adjusting agent containing ionic species producing a tonicity equivalent to not more than a 0.3% solution of sodium chloride.

4,438,012

STABLE AQUEOUS SUSPENSION OF WATER-INSOLUBLE, CALCIUM-BINDING ALUMINOSILICATES AND NONIONIC SUSPENDING AGENTS

Dieter Kühling, Monheim Rhld.; Huppertzl Josef, Düsseldorf-Holthausen; Peter Krings, Krefeld, and Herbert Reuter, Hilden Rhld., all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 620,387, Oct. 7, 1975, Pat. No. 4,072,622. This application Dec. 14, 1977, Ser. No. 860,619

Claims priority, application Austria, Oct. 10, 1974, 8151; Fed. Rep. of Germany, Jun. 19, 1975, 2527388

Int. Cl.³ B01F *3/12;* **C11D** *1/72, 3/12, 17/08*

U.S. Cl. 252—131 **12 Claims**

1. An aqueous suspension having a pH of between 7 and 12 of water-insoluble, calcium binding aluminosilicates with improved stability against settling consisting of

(A) from 20% to 42% by weight on the anhydrous basis of at least one crystalline, finely-divided, water-insoluble silicate compound having a calcium binding power of from 100 to 200 mg CaO/gm when measured at 22° C. for 15 minutes according to the Calcium Binding Power Test Method described in the specification and a primary particle size of from 0.1μ to 30μ and having the formula, combined water not shown

$$(M_2O)_x.Al_2O_3.(SiO_2)_y$$

where M is a member selected from the group consisting of sodium and potassium, x is a number from 0.7 to 1.5 and y is a number from 0.8 to 6, and

(B) from 0.5% to 6% by weight of a practically water-insoluble nonionic aliphatic surface-active compound having a turbidity point of a 1% solution in water of below room temperature, in water, said aqueous suspension being capable of being pumped after 24 hours of standing.

12. An aqueous suspension having a pH of between 7 and 12 of water-insoluble, calcium binding aluminosilicates with improved stability against settling consisting of

(A) from 20% to 42% by weight on the anhydrous basis of at least one crystalline, finely-divided, water-insoluble silicate compound having a calcium binding power of from 100 to 200 mg CaO/gm when measured at 22° C. for 15 minutes according to the Calcium Binding Power Test Method described in the specification and a primary particle size of from 0.1μ to 30μ having the formula, combined water not shown

$$(M_2O)_x.Al_2O_3.(SiO_2)_y$$

where M is a member selected from the group consisting of sodium and potassium, x is a number from 0.7 to 1.5 and y is a number from 0.8 to 6,

(B) from 0.5% to 6% of a practically water-insoluble nonionic aliphatic surface-active compound having a turbidity point of a 1% solution in water of below room temperature, and

(C) a content up to 0.5% by weight, sufficient to exhibit an antifoaming effect, of antifoaming agents selected from the group consisting of foam-reducing soaps, silicones and triazine derivatives, in water, said aqueous suspension being capable of being pumped after 24 hours of standing.

4,438,013

PHOSPHORYLATED AND THIOPHOSPHORYLATED POLY(OXYALKYLATED) HYDRAZINES AND SELECTED ADDUCTS AND THEIR USE AS CORROSION INHIBITORS

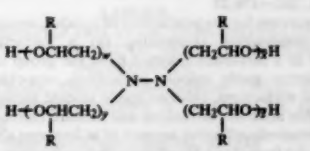
Gregory W. Grynkewich, West Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 27, 1983, Ser. No. 499,039

Int. Cl.³ C23G *1/06, 1/18;* **C07F** *9/02*

U.S. Cl. 252—146 **33 Claims**

1. A composition comprising the reaction product of a poly(oxyalkylated) hydrazine and at least one compound selected from the group consisting of a phosphorylating agent, a thiophosphorylating agent, and mixtures thereof, wherein said poly(oxyalkylated) hydrazine has the formula:



wherein each R is individually selected from hydrogen, lower alkyl groups having from 1 to 4 carbon atoms and phenyl; and the sum of w, x, y, and z is from about 4 to about 25, and wherein the mole ratio of said poly(oxyalkylated) hydrazine to said compound being from about 0.1:1 to 10:1.

4,438,014

NONIONIC SURFACTANTS FOR AUTOMATIC DISHWASHER DETERGENTS

Robert J. Scott, New City, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 16, 1982, Ser. No. 349,174

Int. Cl.³ C11D *1/66*

U.S. Cl. 252—174.21 **1 Claim**

1. A method of washing dishes comprising washing them in a mechanical dishwasher with an aqueous solution comprising a nonionic surfactant having a cloud point of 20°–30° C. and having the formula:

$$R—O—A_x—B—H$$

wherein R is 2-ethylhexanol or n-octanol; A is an oxypropylene group; x is 8 or 9; and B is a random mixture of oxyethylene and oxypropylene groups with the molar ratio of oxyethylene to oxypropylene groups being about 3:1; in a dishwasher detergent exhibiting low-foaming, good wetting and scouring having a chlorine retention of at least 15 percent, and not needing an auxiliary foam suppressor.

4,438,015

LAVATORY CLEANSING BLOCK

Otto Huber, Winterthur, Switzerland, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 17, 1982, Ser. No. 408,988

Claims priority, application United Kingdom, Aug. 24, 1981, 8125733

Int. Cl.³ C11D *3/37, 17/00*

U.S. Cl. 252—174.24 **6 Claims**

1. A process for preparing a lavatory cleansing block intended for immersion in the cistern of a lavatory bowl or urinal, comprising the steps of melting a mixture of 1–25 parts by weight of a copolymer of vinylmethyl ether and maleic anhydride (PVM/MA) having specific viscosity of between 0.1 and 2.0 and 50–99 parts by weight of a solid, water-soluble nonionic surface active compound, heating the melt further to raise the temperature to about 125°–135° C., and keeping it at this level to effect esterification to such an extent that the resulting blocks do not have a tendency to flocculate in use, followed by cooling and adding as desired builders and other ingredients before solidification, casting the liquid product into forms where it solidifies upon further cooling to form blocks or tablets of about 20–150 grams.

4,438,016

STABLE AQUEOUS CLEANING AGENTS AND A PROCESS FOR THEIR PRODUCTION

Eva Kiewert, Dusseldorf, and Karlheinz Disch, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,869

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240088

Int. Cl.³ C11D *3/12*

U.S. Cl. 252—174.25 **8 Claims**

1. A process for the production of a stable, aqueous cleaning agent composition comprising (a) a surfactant-effective amount of a surfactant selected from the group consisting of non-chlorine stable anionic surfaceants, non-chlorine stable nonionic surfactants, chlorine-stable anionic surfactants, chlorine-stable nonionic surfactants and mixture thereof, (b) from 0 to an abrasively-effective amount of at least one abrasive component, (c) from 0 to a bleaching-effective amount of an active-chlorine-releasing compound and (d) from 0 to an effective amount of dyes and (e) from 0 to an effective amount of fragrances, with (f) a further suspending-effective amount of an amorphous calcium aluminum silicate precipitated in situ, where an effective amount of at least one of component (b) and component (c) is present, comprising the steps of mixing component (b), if present, with an aqueous solution of component (a) and component (d) if present, at room temperature, then successively adding under continuous mixing a calcium chloride solution, an aluminum hydroxide solution and a waterglass solution in amounts sufficient to form said component (f) in situ, followed by adding component (c), if present, and component (e) if present, and recovering said stable, aqueous cleaning agent composition.

4,438,017

SCINTILLATION LIQUID COMPATIBLE WITH HIGH PERFORMANCE LIQUID CHROMATOGRAPHY SOLVENTS

Arjun Mallik, Pequannock; Daniel Koetters, Butler, and Harold Edelstein, Fair Lawn, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 28, 1982, Ser. No. 425,622

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—301.17 **4 Claims**

1. A liquid scintillation composition having a substantially uniform counting efficiency when mixed with specimens comprising radio-tagged compositions in a solvent/water mixture over a wide range of solvent/water ratios comprising:

an aromatic liquid capable of capturing energy from radiation;

at least one fluor compound;

optionally one low molecular weight alcohol; and

a surfactant consisting essentially of a oxyalkylated straight chain alcohol or acid.

4,438,018

METAL CATALYZED PREPARATION OF POLYOXYALKYLENE SURFACTANTS FOR PHENOLIC FOAM STABILIZATION

Richard L. Frentzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Continuation of Ser. No. 113,841, Jan. 21, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,868

Int. Cl.³ B01F *17/32, 17/36*

U.S. Cl. 252—356 **69 Claims**

1. A process for preparing a surfactant for cellular foams comprising reacting a cyclic nitrogenous vinyl monomer and an esterified unsaturated dibasic acid by free radical addition polymerization in the presence of

(a) a polyoxyalkylene adduct having the formula

$$H—(\text{polyoxyalkylene chain})_tR,$$

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R,

(b) an organic or inorganic per-compound, and

(c) a metal catalyst selected from the group consisting of ferrocene, acetylferrocene, benzoylferrocene, cobaltocene, 1,1'-diacetylferrocene, 1,1'-ferrocenebis-(diphenylphosphine), nickelocene, hafnocene dichloride, ferrocenecarboxaldehyde, mixtures of said ferrocene compounds and other transition metal compounds containing a metal having an atomic number of 21 to 30, and a mixture of compounds selected from the group consisting of iron (II) sulfate and iron (III) sulfate, iron (II) sulfate and iron (III) chloride, manganese (II) acetylacetonate and manganese (III) acetylacetonate, cobalt (II) benzoate and cobalt (III) acetylacetonate, copper (I) acetate and copper (II) acetylacetonate, and vanadium (III) acetylacetonate and vanadium (IV) oxide acetylacetonate, to provide a foam surfactant composition, wherein the major component of said foam surfactant composition comprises the product formed from the reaction of said cyclic nitrogenous vinyl monomer and unsaturated diester onto said polyoxyalkylene adduct.

35. A surfactant for cellular foams comprising the product of a free radical addition polymerization of a cyclic nitrogenous

vinyl monomer and an esterified unsaturated dibasic acid in the presence of

(a) a polyoxyalkylene adduct having the formula

H—polyoxyalkylene chain)$_t$R,

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R,

(b) an organic or inorganic per-compound and

(c) a metal catalyst selected from the group consisting of ferrocene, acetylferrocene, benzoylferrocene, cobaltocene, 1,1'-diacetylferrocene, 1,1'-ferrocenebis-(diphenylphosphine), nickelocene, hafnocene dichloride, ferrocenecarboxaldehyde, mixtures of said ferrocene compounds and other transition metal compounds containing a metal having an atomic number of 21 to 30, and a mixture of compounds selected from the group consisting of iron (II) sulfate and iron (III) sulfate, iron (II) sulfate and iron (III) chloride, manganese (II) acetylacetonate and manganese (III) acetylacetonate, cobalt (II) benzoate and cobalt (III) acetylacetonate, copper (I) acetate and copper (II) acetylacetonate, and vanadium (III) acetylacetonate and vanadium (IV) oxide acetylacetonate, wherein the major component of said polymerization comprises the product formed from the reaction of said cyclic nitrogenous vinyl monomer and unsaturated diester onto said polyoxyalkylene adduct.

4,438,019

CATALYST FOR THE POLYMERIZATION OF OLEFINS BASED UPON MAGNESIUM AND TRANSITION METAL

Daniel C. Durand, and Pierre M. Mangin, both of Martigues, France, assignors to BP Chimie, Paris, France

Continuation of Ser. No. 63,123, Aug. 3, 1979, abandoned, which is a continuation of Ser. No. 850,230, Nov. 11, 1977, abandoned, which is a continuation of Ser. No. 363,037, May 23, 1973, abandoned. This application Mar. 10, 1981, Ser. No. 242,354

Claims priority, application France, May 25, 1972, 72 18595

Int. Cl.^{3} C08F *4/64, 4/68*

U.S. Cl. 502—169 **1 Claim**

1. The method of preparing pre-oxidized solid catalysts which can be used in the polymerization of olefins having the formula CH_2=CHR in which R is hydrogen or an alkyl group containing 1 to 8 carbon atoms consisting essentially of reacting magnesium, a monohalogenated hydrocarbon selected from the group consisting of chlorine and bromine derivatives of a saturated hydrocarbon and a transition metal compound having the general formula $MX_{4-m}(OR)_m$ wherein X is chlorine, R is an alkyl group having from 2 to 8 carbon atoms, m is a whole number or fraction thereof from 0 to 4 and M is a transition metal selected from the group consisting of titanium and vanadium at a temperature within the range of −20° to 150° C. for a time sufficient to react the magnesium, monohalogenated hydrocarbon and the compound of the transition metal, and then contacting the solid magnesium and transition metal compound resulting from the previous reaction with an oxidizing compound selected from the group consisting of chlorine, bromine and iodine to completely convert the transition metal to its original valence, in which the magnesium, monohalogenated hydrocarbon and transition metal compound are reacted in amounts such that:

(a) the ratio between the number of molecules of the monohalogenated hydrocarbon and the number of magnesium atoms is within the range of 0.5 to 10, and

(b) the ratio between the number of molecules of transition metal and the number of magnesium molecules is less than 0.5

whereby the activity of the catalyst after oxidation is not substantially modified and the oxidized catalyst can be stored and used in the presence of air.

4,438,020

CATALYST SUITABLE FOR PREPARING ALDEHYDES

Mohammad M. Habib, Allison Park, and Wayne R. Pretzer, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 289,404, Aug. 3, 1981, Pat. No. 4,361,706. This application Sep. 13, 1982, Ser. No. 417,534

Int. Cl.^{3} B01J *31/02*

U.S. Cl. 252—162 **34 Claims**

1. A novel catalyst composition comprising (1) cobalt, (2) iodine and (3) a ligand containing phosphorus atoms separated by a sterically constrained carbon-carbon bonding, the molar ratio of cobalt to said ligand being in the range of about 1:2 to about 7:1, and the molar ratio of cobalt to iodine being in the range of about 1:1.15 to about 1:15.

4,438,021

CATALYST FOR DEHYDROCOUPLING OF TOLUENE OR XYLENE

Yoshio Okada; Takashi Terauchi; Makoto Nsoki, and Masatoshi Hino, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,214

Claims priority, application Japan, Mar. 27, 1981, 56-46018; Mar. 27, 1981, 56-46019; Mar. 27, 1981, 56-46020

Int. Cl.^{3} B01J *23/06*

U.S. Cl. 502—341 **1 Claim**

1. A catalyst for dehydrocoupling of toluene or xylene, consisting essentially of an activated catalyst composition represented by the general formula (I):

$$Zn_aTl_bO_c \quad (I),$$

where a denotes a number in a range of 0.25 to 5; b is 1 and c denotes a number necessary for fulfilling the respective average atomic valencies of Zn and Tl in the oxidation states in which they exist in the composition.

4,438,022

LUBRICATING OIL COMPOSITIONS CONTAINING POLYETHER POLYAMINE ETHANES

Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 30, 1982, Ser. No. 403,606

Int. Cl.^{3} C10M *1/32*

U.S. Cl. 252—51.5 R **9 Claims**

1. A lubricating oil composition comprising a major portion of oil of lubricating viscosity, and a minor amount of hydrocarbyl polyoxyalkylene polyamine ethane of molecular weight from about 300 to about 2500; wherein said hydrocarbyl group contains from 1 to about 30 carbon atoms, said polyoxyalkylene moiety comprises 1 to 30 oxyalkylene units selected from oxyalkylene units having from 2 to about 5 carbon atoms, said ethane moiety contains from about 2 to about 8 carbon atoms and said polyamine moiety comprises from about 2 to about 12 amine nitrogen atoms and from about 2 to 40 carbon atoms.

4,438,023

OXYGENATED TRICYCLIC DERIVATIVES OF NORBORNANE AND USE OF SAME AS PERFUMING INGREDIENTS

Werner Skorianetz, Dardagny, and Günther Ohloff, Bernex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

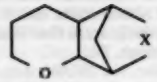
Filed Apr. 8, 1982, Ser. No. 366,552

Claims priority, application Switzerland, May 21, 1981, 3315/81

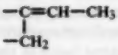
Int. Cl.^{3} C11B *9/00*; C07D *311/78*

U.S. Cl. 252—522 R **7 Claims**

1. Compounds of formula


(I)

wherein symbol X represents a divalent radical of formula



7. A perfuming composition containing as perfuming ingredient 0.1% to 20% of a compound of formula (I) as set forth in claim 1.

4,438,024

STABLE LIQUID DETERGENT COMPOSITIONS

Angela G. DelGreco, Hamilton; Malcolm L. Allen, Cincinnati, and Ronald L. Jacobsen, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 10, 1982, Ser. No. 376,876
Int. Cl.³ C11D *1/14, 1/75, 17/08*
U.S. Cl. 252—545 **5 Claims**

1. A stable liquid detergent composition that recovers, after freezing, to a single isotropic phase by 50° F., comprising:

(a) a C_{12-16} alkyl dimethylamine oxide surfactant;

(b) an alcohol polyethoxylate sulfate surfactant of the formula $R^4O(C_2H_4O)_mSO_3M$ wherein R^4 is an alkyl radical containing from about 12 to about 18 carbon atoms, m is from about 1 to about 4, and M is a compatible cation;

(c) from about 15% to about 25% by weight of a water-soluble nitrilotriacetate detergency builder capable of sequestering calcium and magnesium ions in water solution;

(d) from about 2% to about 4% by weight of monoethanolamine;

(e) from about 4% to about 7% by weight of a hydrotrope selected from the group consisting of the water-soluble salts of toluene sulfonate, xylene sulfonate, cumene sulfonate, and mixtures thereof; and

(f) from about 55% to about 80% by weight of water; said composition containing from about 8% to about 17% by weight of amine oxide and alcohol polyethoxylate sulfate surfactants, provided the molar ratio of amine oxide to alcohol polyethoxylate sulfate is from about 0.8 to about 1.2, and containing from about 25% to about 37% by weight of the amine oxide and alcohol polyethoxylate sulfate surfactants and the water-soluble nitrilotriacetate builder.

4,438,025

DETERGENT COMPOSITIONS

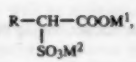
Teruhisa Satsuki, Funabashi; Seiiti Ota, Chiba, and Setsuko Tabata, Tachikawa, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 453,691
Claims priority, application Japan, Dec. 30, 1981, 56-210654
Int. Cl.³ C11D *1/28, 1/665, 1/52*
U.S. Cl. 252—545 **6 Claims**

1. A detergent composition suitable for washing glassware without leaving water spots, and having excellent detergency and foaming characteristics, said composition consisting essentially of:

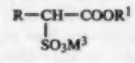
from 15 to 50 parts by weight of a component (a) composed of

(a-1) at least 20% by weight of a water-soluble neutral salt of an α-sulfonated fatty acid represented by the general formula



in which R is an alkyl group having from 12 to 16 carbon atoms and M^1 and M^2 are each independently from the other a cation selected from the class consisting of magnesium ion $\frac{1}{2}Mg^{++}$ and substituted or unsubstituted ammonium ions, and

(a-2) up to 80% by weight of a water-soluble salt of an α-sulfonated fatty acid ester represented by the general formula



in which R has the same meaning as defined above, R^1 is an alkyl group having from 1 to 3 carbon atoms and M^3 is a cation independently selected from the same class as defined for the symbols M^1 and M^2 above, and

from 85 to 50 parts by weight of a component (b) which is a diethanolamide of a higher fatty acid, said fatty acid having about 11 to about 15 carbon atoms on an average in a molecule.

4,438,026

SOLVENT DEWATERING COMPOSITION

Edward G. Tajkowski, Williamsville, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 28, 1983, Ser. No. 470,342
Int. Cl.³ C11D *1/34, 1/68, 3/43;* **C23G** *5/02*
U.S. Cl. 252—545 **6 Claims**

1. A solvent-surfactant drying composition comprising essentially

(a) 1,1,2-trichloro-1,2,2-trifluoroethane, and containing

(b) from about 0.05 to about 0.5 weight percent linear dodecylbenzene sulfonic/amine salt and

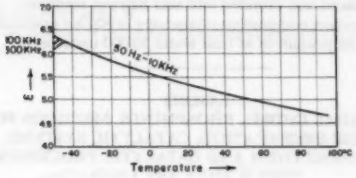
(c) from about 0.05 to about 0.5 weight percent of polyphosphoric ester acid anhydride comprising a reaction product of an aliphatic alcohol of 4–12 carbon atoms and the dimeric phosphoric acid derived from P_2O_5 and

(d) from about 0.05 to about 1 weight percent of a demulsifier selected from the group consisting of (i) acetylenic diols and mixtures thereof with (ii) aliphatic primary alcohols of six to twelve carbon atoms and (iii) phosphate tri-esters having carbon substituents of three to twelve carbon atoms.

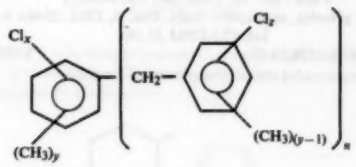
4,438,027
CHLORINATED ALKYLAROMATIC BASED COMPOUNDS AND NEW LIQUID DIELECTRICS

Henri Mathais, Jarrie; Raymond Commandeur, Vizille, both of France; Achille Pontoglio, and Sergio Nebel, both of Brescia, Italy, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 243,143, Mar. 12, 1981, abandoned, which is a continuation of Ser. No. 57,982, Jul. 16, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 429,082
Claims priority, application France, Jul. 27, 1978, 78 22216; Feb. 20, 1979, 79 04259
Int. Cl.³ H01B 3/24
U.S. Cl. 252—581 9 Claims



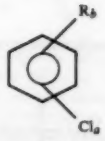
1. Liquid dielectrics of formula:



(1)

where n, x, y and z have value 1 or 2.

4. An insulating fluid comprising one or more compounds according to the formula of claim 1 in admixture with one or more compounds of the general formula:



(2)

in which a varies from 2 to 4, b varies from 0 to 2 and R is an aliphatic hydrocarbon radical containing 1 to 3 carbon atoms and an acid acceptor.

4,438,028
FIRE RETARDANT AND COMPOUNDS BASED THEREON

Hans-Bernd Schmittmann, Langenhorster Str. 30, 5620 Velbert, Fed. Rep. of Germany, and Alfons Thier, Rosbach, Fed. Rep. of Germany, assignors to Charles M. Wiersma and Jack G. Wiersma, both of Grand Rapids, Mich., by said Alfons Thier

Filed Jan. 11, 1982, Ser. No. 338,544
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1981, 3100626
Int. Cl.³ C09K 3/28
U.S. Cl. 252—609 87 Claims

1. A fire retardant plastic comprising:

a plastic resin composition combined with monoammonium phosphate, ammonium polyphosphate, an inorganic compound which releases water when heated, an anhydrous inorganic compound capable of hydration, and a urea polymer.

2. The fire retardant plastic of claim 1 wherein said anhydrous inorganic compound is anhydrous borax.

3. The fire retardant plastic of claim 1 in which said inorganic compound which releases water when heated is selected from the group consisting of borax decahydrate, borax pentahydrate and boric acid.

4,438,029
SYNTHETIC PEPTIDES

Bruce W. Erickson, Closter, N.J., and Tony E. Hugli, San Diego, Calif., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 870,713, Jan. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 762,427, Jan. 25, 1977. This application Feb. 21, 1979, Ser. No. 13,176
Int. Cl.³ C07C 103/52
U.S. Cl. 260—112.5 R 17 Claims

1. Ala-Ser-His-Leu-Gly-Leu-Ala-Arg-Gly.

4,438,030
ANTIBODIES TO IMMUNOGENIC PEPTIDES AND THEIR USE TO PURIFY HUMAN FIBROBLAST INTERFERON

David J. Ganfield, Clementon, N.J.; Michael W. Hunkapiller, San Gabriel, Calif.; Ernest Knight, Jr., and Bruce D. Korant, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 172,466, Jul. 25, 1980, Pat. No. 4,341,761. This application Mar. 30, 1982, Ser. No. 363,743
Int. Cl.³ C07C 103/52; A61K 45/02
U.S. Cl. 260—112.5 R 2 Claims

1. A process for purifying human fibroblast interferon contained in a liquid phase mixture of proteins, comprising (i) contacting the protein mixture with antibodies produced in response to the peptide having the amino acid sequence:

(X-Ser-Tyr-Asn-Leu-Leu-Gly-Phe-Leu-Gln-Arg-Ser-Ser-Asn-Phe-Gln-Y-Gln-Lys-Leu-Leu)$_n$

wherein:

X is selected from Met and Ser,

Y is selected from His and Cys, and

n is 1 to 12;

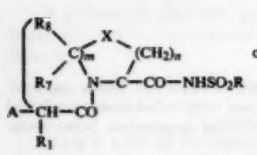
and forming an interferon-antibody complex; (ii) separating the interferon-antibody complex from the liquid phase; and (iii) separating the interferon from the antibody.

4,438,031
N-(ALKYLSULFONYL)-L-PROLINE AMIDE AND N-(ALKYLSULFONYL)-2-CARBOXYLIC ACID AMIDE-INDOLINE DERIVATIVES

Michael W. Winkley, Malvern, and Scott J. Childress, Philadelphia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

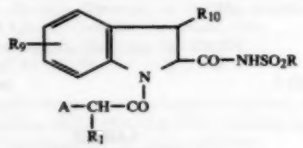
Filed Feb. 24, 1982, Ser. No. 351,716
Int. Cl.³ C07D 209/26, 207/16, 277/06; C07C 103/52
U.S. Cl. 260—112.5 R 23 Claims

1. A compound of the formula:



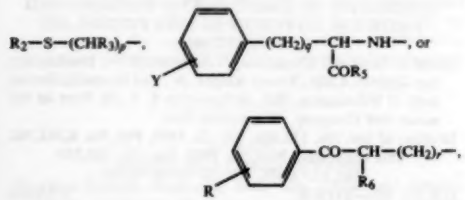
Ia

or



Ib

wherein:
m is 0 or 1, and m is 1 when X is S;
n is 1 or 2;
X is —CH_2— or S;
R is methyl, ethyl, n-propyl, or iso-propyl;
R_7 is hydrogen, lower alkyl, lower alkoxy, phenyl, or substituted phenyl;
R_8 is hydrogen or lower alkyl;
R_9 is hydrogen, hydroxy, lower alkyl, lower alkoxy, or halogen;
R_{10} is hydrogen or lower alkyl;
R_1 is hydrogen, lower alkyl, phenyl, substituted phenyl, phen-lower alkyl, substituted phen lower alkyl, amino lower alkyl, or perfluoroalkyl;
A is:



in which:
R_2 is hydrogen or R_4CO— where R_4 is hydrogen, lower alkyl, phenyl, substituted phenyl, phen lower alkyl, or substituted phen lower alkyl;
R_3 is hydrogen, lower alkyl, benzoyl, or substituted benzoyl;
R_6 is SR_{11} where R_{11} is hydrogen, lower alkanoyl, benzoyl, substituted benzoyl, benzoxycarbonyl, or substituted benzoxycarbonyl;
R_5 is hydroxy, lower alkoxy or amino;
Y is hydrogen, halogen, a lower alkyl group, or a lower alkoxy group;
p is 0 or 1;
q is 0–3; and
r is 0 or 1.

4,438,032
UNIQUE T-LYMPHOCYTE LINE AND PRODUCTS DERIVED THEREFROM

David W. Golde, and Shirley G. Quan, both of Los Angeles, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 229,900, Jan. 30, 1981, abandoned. This application Jan. 6, 1983, Ser. No. 456,177
Int. Cl.³ C12P 21/00; C12N 15/00; C12R 1/91; C07G 7/00
U.S. Cl. 260—112 R 22 Claims

1. A method for producing in isolatable amounts an excretory protein produced by a T-lymphocyte,
said method comprising:
cultivating as a single cell suspension the Mo cell line in a nutrient medium, whereby said excretory proteins are produced and excreted into said nutrient medium.

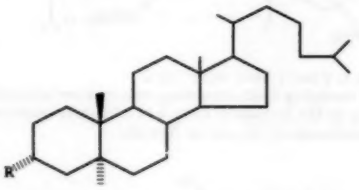
14. A protein composition comprising erythroid potentiating factor in an amount of at least about 50,000 units/mg.

4,438,033
STEROIDAL CHIRAL PHOSPHINES, METHODS FOR THEIR PREPARATION, CATALYTIC SYSTEMS CONTAINING THEM AND CATALYTIC PROCESSES IN WHICH THEY ARE USED

Carlo Botteghi, Alghero; Serafino G. Gladiali, Sassari; Mauro Marchetti, Sassari, and Giovanni A. Faedda, Sassari, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

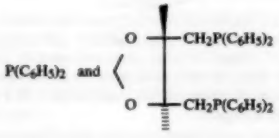
Filed Nov. 18, 1982, Ser. No. 442,679
Claims priority, application Italy, Dec. 4, 1981, 25463 A/81
Int. Cl.³ C09J 21/00
U.S. Cl. 260—239.55 C 5 Claims

1. New steroidal chiral phosphines of formula:



(I)

wherein R represents a phosphorated group selected between



4,438,034
PROCESS FOR PREPARING LACTAM MAGNESIUM HALIDES

Albert Y. Garner, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 10, 1983, Ser. No. 456,702
Int. Cl.³ C07D 223/10
U.S. Cl. 260—239.3 R 34 Claims

1. A method of preparing a lactam magnesium halide comprising the steps of:
a. Reactively admixing magnesium, hydrocarbon halide, and lactam in the presence of a cyclic ether solvent, wherein the halide is either chloride or bromide; and
b. removing the cyclic ether and the hydrocarbon residue.

3. The method of claim 1 wherein said lactam is caprolactam.

4,438,035

METHOD OF PREPARING BENZOTHIAZEPINE DERIVATIVES

Mitsunori Gaino, Omiya; Ikuo Iijima, Urawa; Shigeru Nishimoto, Minoh; Kuichiro Ikeda, Onoda, and Tokuo Fujii, Yamaguchi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Dec. 1, 1982, Ser. No. 445,964

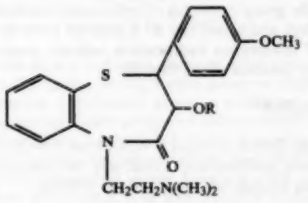
Claims priority, application Japan, Dec. 7, 1981, 56-197358

Int. Cl.³ C07D 281/02

U.S. Cl. 260—239.3 B **12 Claims**

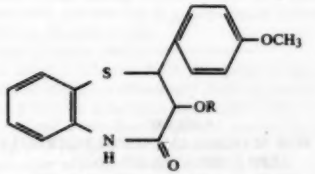
1. A method of preparing a benzothiazepine derivative of the formula:

(I)



wherein R is hydrogen or acetyl, or a pharmaceutically acceptable acid addition salt thereof, which comprises condensing a compound of the formula:

(II)



wherein R is the same as defined above, with 2-(dimethylamino)ethyl halide either in the presence of potassium hydroxide in acetone or in the presence of potassium carbonate in a solvent selected from acetone, lower alkyl acetate, a mixture of acetone and water and a mixture of lower alkyl acetate and water, and if required, further converting the product into a pharmaceutically acceptable acid addition salt thereof.

4,438,036

β-LACTAM ANTIBIOTICS THEIR PREPARATION AND THEIR USE

David F. Corbett, Reigate; Robert Southgate, Warnham, and Steven Coulton, Cranleigh, all of England, assignors to Beecham Group Limited, England

Filed Oct. 13, 1981, Ser. No. 310,491

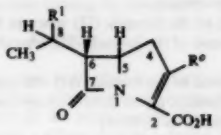
Claims priority, application United Kingdom, Oct. 25, 1980, 8034453

Int. Cl.³ C07D 487/04

U.S. Cl. 260—245.2 T **5 Claims**

1. A process for the preparation of a compound of the formula (II):

(II)

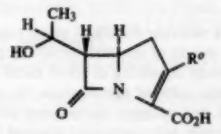


or a pharmaceutically acceptable salt or in vivo hydrolyzable ester thereof, wherein R^1 is azido, amino or hydroxy, or is a group of the sub-formula (a):

$$-OCOR^3 \quad \text{(a)}$$

wherein R^3 is hydrogen or C_{1-6} alkyl, aryl or aryl (C_{1-6}) alkyl; and R^o is hydrogen or $-S(O)_xR^2$, wherein x is zero or one and R^2 is C_{1-6} alkyl, unsubstituted or monosubstituted by amino, di-(C_{1-6} alkyl) amino, C_{1-6} alkyl amino, acylamino, hydroxy, C_{1-6} alkanoyloxy, C_{1-6} alkoxy, benzoyl, C_{1-6}-alkanoyl or carboxy or an ester or pharmaceutically acceptable salt thereof; C_{2-6} alkenyl, unsubstituted or monosubstituted by hydroxy, C_{1-6} alkoxy, acetamido, propionamido or carboxy or an ester or pharmaceutically acceptable salt thereof; C_{2-6} alkynyl; C_{1-6} alkanoyl; phenyl, naphthyl, pyrrolyl, furyl, tetrazolyl, thienyl, indolyl, thionaphthyl, benzofuryl, imidazolyl or thiazolyl, each of which being unsubstituted or monosubstituted by C_{1-3} alkyl, phenyl, nitro, amino or phenyl substituted by halogen, C_{1-3} alkoxy or acetamido; phenyl C_{1-6} alkyl, unsubstituted or monosubstituted by halogen, C_{1-3} alkoxy, nitro or acetamido; pyrrolyl C_{1-6}-alkyl, unsubstituted or monosubstituted by phenyl or C_{1-3}-alkyl; thienyl C_{1-6} alkyl, unsubstituted or monosubstituted by phenyl or C_{1-3} alkyl; furyl C_{1-6} alkyl, unsubstituted or monosubstituted by phenyl or C_{1-3} alkyl; tetrazolyl C_{1-6}-alkyl, unsubstituted or monosubstituted by phenyl or C_{1-3}-alkyl; imidazolyl C_{1-6} alkyl, unsubstituted or monosubstituted by phenyl, nitro, amino or C_{1-3} alkyl; thiazolyl C_{1-6} alkyl, unsubstituted or monosubstituted by one or more phenyl, nitro, amino or C_{1-3} alkyl; phenyl C_{1-6} alkanoyl; phenoxy C_{1-6} alkanoyl; or benzoyl; which comprises the reaction of an ester of a compound of the formula (III):

(III)



wherein the stereochemistry at C-8 is inverted compared to that at C-8 of the compound of the formula (II), with

(a) a compound of the formula (IV):

$$R^4—H \quad \text{(IV)}$$

wherein R^4 is azido or a group of the sub-formula (a);

(b) a compound of the formula (V):

$$R^5O.CO.N{=}N.CO.OR^6 \quad \text{(V)}$$

wherein R^5 and R^6 are independently C_{1-6} alkyl, aryl-C_{1-6} alkyl or aryl; and

(c) a compound of the formula (VI):

(VI)

wherein l, m and n are independently zero or one and R^7,

R^8 and R^9 are independently C_{1-6} alkyl, aryl C_{1-6} alkyl or aryl and thereafter if necessary:

(i) reducing a compound of the formula (II) wherein R^1 is azido to form a compound of the formula (II) wherein R^1 is amino; or

(ii) hydrolyzing a compound of the formula (II) wherein R^1 is a group of the sub-formula (a) to form a compound of the formula (II) wherein R^1 is hydroxy.

4,438,037

OXIDATION OF AROMATIC COMPOUNDS TO QUINONES BY USE OF SODIUM HYPOCHLORITE

Thomas F. Rutledge, Avalon, N.J., assignor to ICI Americas Inc., Wilmington, Del.

Filed Aug. 27, 1982, Ser. No. 412,140

Int. Cl.³ C07C *45/28, 50/18*

U.S. Cl. 260—385 **7 Claims**

1. A method for the preparation of anthraquinones which comprises oxidizing corresponding anthracenes dissolved in an inert organic solvent in the presence of an aqueous solution of sodium hypochlorite as oxidizing agent and maintaining the pH of the process at from about 4.5 to about 8.0.

4,438,038

PROCESS FOR THE PRODUCTION OF OIL-SOLUBLE METAL SALTS

Joseph Petronella, Old Bridge Township, Middlesex County, N.J., assignor to Nuodex Inc., Piscataway, N.J.

Continuation-in-part of Ser. No. 234,514, Feb. 17, 1981, Pat. No. 4,337,208. This application May 13, 1982, Ser. No. 378,022

Int. Cl.³ C07F *1/08, 15/04, 15/06;* C11C *1/00*

U.S. Cl. 260—414 **10 Claims**

1. In the process for the production of oil-soluble metal salts wherein a reaction mixture that comprises a polyvalent metal, an organic monocarboxylic acid having 5 to 18 carbon atoms, water, and an inert, water-immiscible organic solvent is heated in the presence of oxygen for a period of time sufficient to form the metal salt of said monocarboxylic acid, the improvement wherein the reaction between the polyvalent metal and the monocarboxylic acid is carried out in the presence of an alkali metal salt catalyst.

6. The process of claim 1 wherein the alkali metal catalyst comprises 30% to 70% by weight of an alkali metal salt component selected from the group consisting of alkali metal salts of mineral acids, alkali metal salts of monocarboxylic acids having 1 to 4 carbon atoms, and mixtures thereof and 30% to 70% by weight of an ammonium salt component selected from the group consisting of ammonium salts of mineral acids, ammonium salts of monocarboxylic acids having 1 to 4 carbon atoms, and mixtures thereof.

4,438,039

TITANIUM CHELATE CATALYST FOR SILICONE COMPOSITIONS

Melvin D. Beers, Schenectady, and Richard P. Surprenant, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,327

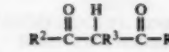
Int. Cl.³ C07F *7/28*

U.S. Cl. 260—429.5 **25 Claims**

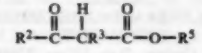
1. A titanium chelate catalyst for room temperature vulcanizable silicone rubber compositions which does not form nodules upon standing prior to cure comprising a first reaction product of a titanium compound of the formula,

$$Ti(OR)_4$$

with a first ketone compound of the formula,



and with a second ketone compound of the formula



where R and R^2 are halogen substituted or unsubstituted monovalent hyudrocarbon radicals, R^3 is selected from the group consisting of hydrogen, hydrocarbyl, halohydrocarbyl, and acyl, all not having more than 8 carbon atoms and taken together with R^2 forms together with the carbon atoms to which they are attached a cyclohydrocarbon substituent of not more than about 12 carbon atoms and chloro, nitro, acyl, cyano and carboxy ester substituted cyclic hydrocarbon substituents, R^4 is a radical selected from the class consisting of radicals having not more than about eight carbon atoms selected from the group consisting of hydrocarbyl halohydrocarbyl, cyanoalkyl, and amino and R^5 is selected from the group consisting of monovalent hydrocarbon radicals, amino, ether and polyether moieties of the formula,

$$-(C_qH_{2q}O)_vR^{30}$$

where q varies from 2 to 4 and v varies from 1 to 20 and R^{30} is a monovalent hydrocarbon radical; said first reaction product then being reacted with a diol of the formula

$$HO—R^6—OH$$

to produce the second and final catalyst reaction product where R^6 is a divalent hydrocarbon radical of 2 to 20 carbon atoms.

4,438,040

PROCESS FOR MAKING AMINOPOLYCARBOXYLIC ACID CHELATES OF IRON

Katherine H. Svatek, Lake Jackson; David A. Wilson, Richwood, and Freddie Griffin, Jr., Missouri City, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 184,848, Sep. 8, 1980, Pat. No. 4,364,871. This application May 12, 1982, Ser. No. 377,519

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.³ C07F *15/02*

U.S. Cl. 260—439 R **9 Claims**

1. A process for producing a ferric-ammonium-chelate of an aminopolycarboxylic acid wherein an oxide of iron is reacted with an aminopolycarboxylic acid chelant in the presence of a base, which comprises: (1) providing a mixture in water of ammonia together with said chelant in a molar ratio of ammonia to chelant of at least 1.05 but not more than 1.5, (2) adding to said mixture said oxide of iron at less than 1 mole of iron per mole of chelant, (3) heating said mixture to a reaction temperature within the range of from about 85° to about 105° C., (4) maintaining said reaction temperature for a time sufficient to complete the reaction, (5) cooling said mixture to a temperature within the range of from about 45° to 80° C., (6) introducing ammonia to said mixture in sufficient amount to dissolve and to maintain in solution the iron chelate so formed, (7) cooling said chelate solution to room temperature and (8) oxidizing any ferrous ion present in said chelate solution to the ferric ion.

4,438,041

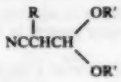
PROCESS FOR PREPARING ESTERS OF CYANOACETIC ACIDS

Kanenobu Matsui; Shinichiro Uchiumi; Mitsuo Takahashi; Hideki Asada, and Masaru Kurahashi, all of Ube, Japan, assignors to UBE Industries, Ltd., Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,417
Claims priority, application Japan, Jun. 9, 1981, 56-87471
Int. Cl.³ C07C *120/00, 121/16, 121/46, 121/66*
U.S. Cl. 260—464 9 Claims

1. A process for preparing an ester of cyanoacetic acid with an alcohol selected from the group consisting of an aliphatic alcohol, a substituted aliphatic alcohol having a nitro group or a halogen atom substituent, an alicyclic alcohol and a substituted alicyclic alcohol having a nitro group or a halogen atom substituent which comprises reacting

(i) a cyanoacetaldehyde acetal represented by the general formula



wherein R is a hydrogen atom, an alkyl group, a substituted alkyl group having a nitro group or a halogen atom substituent, a cycloaklyl group, a substituted cycloalkyl group having a nitro group or a halogen atom substituent, a phenyl group, a substituted phenyl group having a nitro group or a halogen atom substituent, an aralkyl group, and a substituted aralkyl group having a nitro group or a halogen atom, and R′ is an alkyl group, a substituted alkyl group having a nitro group or a halogen atom substituent, a cycloalkyl group, a substituted cycloalkyl group having a nitro group or a halogen atom substituent, a phenyl group, a substituted phenyl group having a nitro group or a halogen atom substituent, an aralkyl group, a substituted aralkyl group having a nitro group or a halogen atom substituent, and the two R′ groups can be linked to form a bridging alkylene group;

(ii) hydroxylamine; and

(iii) an alcohol selected from the group consisting of an aliphatic alcohol, a substituted aliphatic alcohol having a nitro group or a halogen atom substituent, an alicyclic alcohol and a substituted alicyclic alcohol having a nitro group or a halogen atom substituent,

with each other at a temperature of 50° to 150° C., the amount of said hydroxylamine being within the range of 0.1 to 10 moles per one mole of said cyanoacetaldehyde acetal, to form said ester of cyanoacetic acid.

4,438,042

PREPARATION OF AROMATIC/ALIPHATIC NITRILES

Roland Jacques, Ales; Michel Reppelin, Collonges-au-Mont-d'Or, and Laurent Seigneurin, Salindres, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 14, 1982, Ser. No. 378,226
Claims priority, application France, May 15, 1982, 81 09695
Int. Cl.³ C07C *120/10*
U.S. Cl. 260—465 B 18 Claims

1. A process for the preparation of an aromatic or aliphatic nitrile having the formula:

$$Ar—A—CN \quad (I)$$

wherein Ar is a benzene radical and A is a direct chemical bond or a hydrocarbon radical having from 1 to 6 carbon atoms, comprising heating to a temperature ranging from about 450° C. to about 550° C. a formamide or formanilide having the formula:

$$Ar—A—NHCHO \quad (II)$$

or an amide having the formula:

$$Ar—A—CONH_2 \quad (III)$$

in the presence of a fluorinated siliceous catalyst, said catalyst having been prepared by (i) impregnating a particulate silica prepared by the precipitation of sodium silicate with sulfuric acid, with a dilute aqueous solution of hydrofluoric acid, said hydrofluoric acid solution having a concentration in HF of less than about 5% by weight, and the ratio by weight of the hydrofluoric acid contained in said aqueous solution thereof to the silica being less than about 5%, followed by (ii) drying the catalyst thus impregnated.

4,438,043

PROCESS FOR PREPARATION OF DI- OR TRIFLUOROMETHOXYPHENYL KETONES OR DI- OR TRIFLUOROMETHYLTHIOPHENYL KETONES

Michel Desbois, Rillieux, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jun. 28, 1982, Ser. No. 392,886
Claims priority, application France, Apr. 22, 1982, 82 6903
Int. Cl.³ C07C *121/75, 45/43, 149/00*
U.S. Cl. 260—465 F 12 Claims

1. A process for the preparation of di- or trifluoromethoxyphenyl ketones or di- or trifluoromethylthiophenyl ketones comprising reacting a di- or trihalomethoxybenzene or a di- or trihalomethylthiobenzene with a trihalomethylated aromatic or aliphatic compound in the presence of boron trifluoride in an amount such that the absolute pressure of boron trifluoride within the reaction vessel exceeds 1 bar and in the presence of hydrofluoric acid as a solvent; and hydrolyzing the resultant product.

4,438,044

DI-L-CYSTEINE L-MALATE AND PROCESS FOR THE PRODUCTION THEREOF

Ichiro Chibata, Suita; Akihiko Sumi, Ashiya; Osamu Ohtsuki, Nagaokakyo, and Nozomu Izutsu, Yao, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed Jul. 16, 1981, Ser. No. 284,119
Claims priority, application Japan, Jul. 31, 1980, 55-106280
Int. Cl.³ C07C *51/02*
U.S. Cl. 260—501.12 9 Claims

1. Di-L-cysteine L-malate of the formula:

$$[HS—CH_2—CH(NH_3)^+—COOH]_2.(^-OOC—CHOH—CH_2—COO^-)$$

2. A process for the preparation of di-L-cysteine L-malate which comprises reacting 2 mole of L-cysteine mineral acid salt with more than 0.9 mole of L-malic acid in the presence of an alkali metal hydroxide and collecting the resulting crystalline di-L-cysteine L-malate.

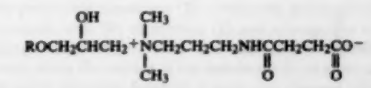
4,438,045

AMPHOTERIC SURFACTANTS

Edward C. Y. Nieh, and Carter G. Naylor, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,957
Int. Cl.³ C11D *1/88*; C07C *101/20*
U.S. Cl. 260—501.13 22 Claims

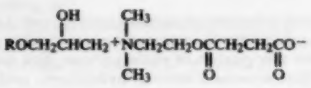
1. A composition of matter of the general formula:



wherein R is selected from the group consisting of a linear

alkyl, a branched alkyl and an alkylaryl containing from 8 to 20 carbon atoms.

12. The composition of matter of the general formula:



wherein R is selected from the group consisting of a linear alkyl, a branched alkyl and an alkylaryl of 8 to 20 carbon atoms.

4,438,046

QUATERNARY AMMONIUM SALTS

Edward L. Grew, Huntingdon, England, and Nigel D. V. Wilson, Midlothian, Scotland, assignors to Glaxo Group Limited, London, England

Filed Apr. 29, 1982, Ser. No. 372,850

Claims priority, application United Kingdom, Apr. 30, 1981, 8113416; Aug. 14, 1981, 8124864

Int. Cl.³ C07C *87/68*; C12F *5/00*

U.S. Cl. 260—501.15 **9 Claims**

1. Crystalline lignocaine benzyl benzoate hydrate.

4,438,047

PROCESS FOR THE PREPARATION OF AN AQUEOUS 3-CHLORO-2-SULFOPROPIONIC ACID REAGENT

Martin M. Tessler, Edison, and Dennis V. Neigel, Whitehouse Station, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 208,371, Nov. 19, 1980, abandoned. This application Sep. 28, 1981, Ser. No. 306,129

Int. Cl.³ C07C *143/02*

U.S. Cl. 260—513 R **9 Claims**

1. A process for preparing an aqueous 3-chloro-2-sulfopropionic acid reagent, which comprises the steps of:

(a) forming a reaction mixture by adding acrylic acid to chlorosulfonic acid maintained at about 45° to 130° during said addition;

(b) heating said reaction mixture at about 60° to 130° C. to form anhydrous 3-chloro-2-sulfopropionic acid reagent; and

(c) adding water to said anhydrous reagent maintained at about 65° and below 100° C.; said water being added in an amount sufficient to decompose said unreacted chlorosulfonic acid and to dilute said anhydrous reagent to a solids content of about 50–95% by weight, based on total reagent solids.

4,438,048

PROCESS FOR THE MANUFACTURE OF MIXED PHOSPHORIC ACID ESTER COMPOSITIONS

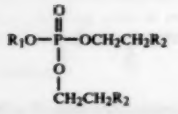
Joseph H. Finley, Metuchen, and Hsiang P. Liao, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 4, 1982, Ser. No. 432,603

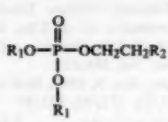
Int. Cl.³ C07F *9/09*

U.S. Cl. 260—982 **3 Claims**

1. A process for the manufacture of a mixed phosphoric acid ester composition comprising by weight less than about 4% of a triphenyl phosphate; from about 30% to about 35% of a phenyl dialkoxyalkyl phosphate having the formula:



and from about 60% to 65% of an alkoxyalkyl diphenyl phosphate having the formula:



wherein R_1 is a phenyl radical and R_2 is an alkoxyalkyl radical, which comprises:

(a) heating about 2 moles of an alcohol characterized by a boiling point above about 170° C. and having the formula:

$$R_2CH_2CH_2OH$$

with a catalytic amount of from greater than about 1.5 mole percent to about 2 mole percent based on the alcohol of sodium hydroxide in an aqueous solution under vacuum to distill off the water present in the mixture and form a sodium alkoxide;

(b) adding about 1.0 mole of a triphenyl phosphate of the formula:

$$(R_1O)_3P{=}O$$

to the reaction mixture under a nitrogen atmosphere and maintaining the temperature at about 100° C. with agitation for about an hour;

(c) heating the reaction mixture at 100° C. to 140° C. under vacuum to remove aromatic and aliphatic alcohols from the reaction mixture; and

(d) distilling the filtrate in a wiped film still under vacuum and at a temperature below the decomposition temperature of said mixed phosphoric acid ester composition to obtain the desired product.

4,438,049

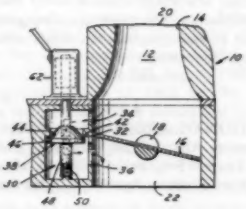
CARBURETOR ENGINE IDLE SPEED AIR BYPASS

Edward A. Ammons, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 7, 1982, Ser. No. 415,053

Int. Cl.³ F02M *3/06*

U.S. Cl. 261—42 **8 Claims**



1. An engine idle speed air flow control for a carburetor having an air induction passage and a throttle valve mounted for a rotatable movement across the passage between a closed engine idle speed position and a wide open position to control the flow of air therethrough, the passage being open to air at one end and adapted to be connected to the engine intake manifold at the other end, an engine idle speed air bypass channel connecting the induction passage on opposite sides of the throttle valve for the bypass of air around the throttle valve when the throttle valve is in a closed position, the control comprising

a two-stage bypass control valve in the channel spring biased to a closed position blocking the channel and movable through one stage to an open position to open the channel,

a variable volume flow-through passage located in the valve connecting air to opposite sides of the valve at all times for another stage of operation, and means for varying the volume of flow through the valve passage to control the bypass of air.

4,438,050

METHOD FOR THE MANUFACTURE OF VERY DENSE OXIDIC NUCLEAR FUEL BODIES

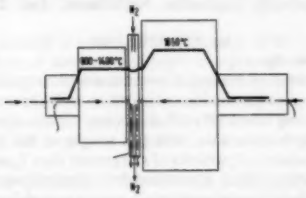
Wolfgang Dörr, Herzogenaurach; Gerhard Gradel, Erlangen, and Martin Peehs, Bubenreuth, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 190,981

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939415

Int. Cl.³ G21C *3/62*

U.S. Cl. 264—0.5 **12 Claims**



1. Method for the manufacture of very dense oxidic nuclear fuel bodies of UO_2 with additions of rare earth oxides which act as a neutron poison in the relatively large amount of more than 4% to 10% by weight, comprising the following steps:

(a) Mixing of the nuclear fuel powder with more than 4% up to 10% by weight powder or rare earth oxide which acts as a burnable neutron poison,

(b) pressing the mixture into blanks,

(c) sintering the blanks in an oxidizing atmosphere at 800° to 1400° C. for a time of 15 minutes to 2 hours, and

(d) sintering the blanks, which had been subjected to sintering in an oxidizing atmosphere, in a reducing atmosphere at temperatures above 1650° C. for a time of 30 minutes to 4 hours.

4,438,051

PROCESS FOR PRODUCING A TRANSLUCENT β-SIALON SINTERED PRODUCT

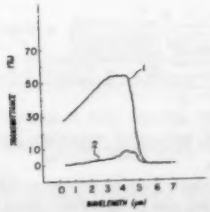
Mamoru Mitomo; Yusuke Moriyoshi; Toshikazu Sakai, and Toshiaki Osaka, all of Sakura, Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Jun. 14, 1982, Ser. No. 387,779

Claims priority, application Japan, Jul. 6, 1981, 56-105301

Int. Cl.³ C04B *35/58, 35/64*

U.S. Cl. 264—1.2 **6 Claims**



1. A process for producing a translucent β-SIALON sintered product, which comprises mixing fine powders of silicon nitride and aluminum nitride having a high purity of at least 99% and a particle size of at most 200 microns and fine powders of aluminum oxide and silicon oxide having a high purity of at least 99% in such a proportion as to form β-SIALON of the formula $Si_{6-z}Al_zO_zN_{8-z}$ where z is from 1 to 4.2, and hot-pressing the mixture in a nitrogen atmosphere at a temperature of from 1500° to 1850° C. under pressure of from 10 to 1500 kg/cm².

4,438,052

PROCESS AND DEVICE FOR PRODUCING BILAYER VESICLES

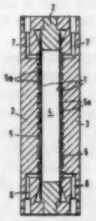
Hans G. Weder, E. Merck, Postfach 4119, 6100 Darmstadt 1, Fed. Rep. of Germany; Otmar Zumbühl, Wolfenshiessen; Reto Schwendener, Arosa, both of Switzerland, and Manfred Milsmann, Bielefeld, Fed. Rep. of Germany, assignors to Hans Georg Weder, Zurich, Switzerland

Filed Jan. 14, 1981, Ser. No. 224,993

Claims priority, application Switzerland, Jan. 16, 1980, 340/80

Int. Cl.³ B01J *13/02*; B01D *13/00*

U.S. Cl. 264—4.6 **7 Claims**



1. A process for producing unilamellar bilayer vesicles of substantially homogeneous size from a colloidal solution comprising mixed micelles of a bilayer-forming substance and a detergent,

the process comprising removing the detergent from the micelle-containing colloidal solution by means of flow-through dialysis whereby the colloidal solution is dialyzed against a dialysis liquid in a chamber whose walls are at least partially formed by a semi-permeable membrane, wherein the dialysis liquid is moved along the outer side of the semi-permeable membrane in laminar flow in at least one channel at a sufficient velocity to ensure that the detergent concentration in the dialysis liquid, on at least 90% of the active surface of the membrane, is at most 10% of the detergent concentration in the micelle solution in contact with the other side of the membrane, and wherein a homogeneous detergent concentration is maintained in the micelle solution by the movement of the latter.

7. A dialysis device for carrying out the process of claim 1, comprising a chamber (4) for the micelle solution, the walls of said chamber being at least partially formed of a semi-permeable membrane; means for moving the micelle solution in the chamber; at least one flow-through compartment for the dialysis liquid, which compartment has an inlet and an outlet for the dialysis liquid and is separated from the chamber (4) by a semi-permeable membrane (1); continuous guide elements (5*a*) in contact with the membrane (1) and arranged in the flow-through compartment such that the dialysis liquid can be moved along the surface of the membrane (1) in a laminar flow, said guide elements forming at least one channel which is in contact with the active surface of the membrane and extends continuously therealong from said inlet to said outlet and within which the dialysis liquid is guided along said membrane.

4,438,053

MAKING A FIBRILLATED SYNTHETIC-RESIN STRAND

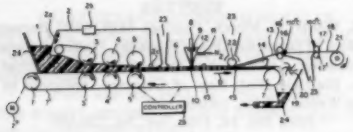
Karl-Heinz Banke; Elisabeth Hering; Wilfried Löbel, all of Karl-Marx-Stadt; Dieter Pollack; Günter Wiedemann, both of Dresden; Ute Grell, Malchow, and Ingo Schüler, Pirna-Copitz, all of German Democratic Rep., assignors to Forschungsinstitut für Textiltechnologie, Karl-Marx-Stadt, German Democratic Rep.

Filed Apr. 9, 1982, Ser. No. 367,071

Claims priority, application German Democratic Rep., Apr. 12, 1981, 229183

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—25 16 Claims



1. A method of making a fibrillated strand, said method comprising the steps of:

compressing a mass of a powder of a high polymer of a predetermined density into a substrate having a density smaller than that of said high polymer and having a multiplicity of gas-filled voids;

playing a laser beam only on a spot on said substrate to melt the high-polymer at the spot and simultaneously heat the gas of said voids to explosively enlarge same;

relatively displacing said beam and said substrate so that same is melted along a path into a porous strand extending along said path in said substrate;

cooling said substrate at said path after irradiation by said beam to resolidify said porous strand;

separating the resolidified strand from said substrate; and

at least uniaxially stretching the separated strand.

4,438,054

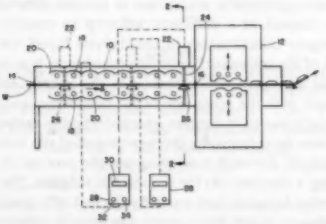
METHOD AND APPARATUS FOR MEASURING AND CONTROLLING FOAM SHEET BLOW-UP IN A THERMOFORMER OVEN

M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 20, 1982, Ser. No. 435,590

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—40.6 17 Claims



1. A method of measuring and controlling foam plastic sheet blow-up by regulating the operation of a thermoformer oven responsive to measuring of the thickness of a continuous sheet of a thermoformable foam plastic material which is conveyed through said thermoformer oven towards a thermoforming installation; comprising:

(a) sensing the sheet thickness of the thermoformable material at a plurality of locations within said thermoformer oven;

(b) and regulating the temperatures within said thermoformer oven in response to the sensed sheet thickness for maintaining the temperatures of said web of thermoformable material at predetermined temperature levels so as to thereby obtain a requisite blow-up of the material.

4,438,055

METHOD OF MAKING A CERAMIC ARTICLE AND ARTICLES MADE BY THE METHOD

Jan H. Van der Velden, Apeldoorn, Netherlands, assignor to Esmil, B.V., Netherlands and Hoeke Engineering, N.V., Belgium

Continuation of Ser. No. 84,131, Oct. 12, 1979, abandoned, which is a continuation of Ser. No. 916,009, Jun. 16, 1979, abandoned. This application Aug. 10, 1981, Ser. No. 291,429

Claims priority, application Netherlands, Jun. 21, 1977, 7706797

Int. Cl.³ B29J *1/00*

U.S. Cl. 264—44 7 Claims

1. A method of making a ceramic article comprising the steps of preparing a mixture of (a) 40 to 65% (by weight) of clay consisting essentially of aluminum silicate, Fe_2O_3 and CaO of which more than 10% (by weight of the clay) is a fraction consisting of particles of size greater than 2_μ and (b) an organic fraction which is obtained from domestic waste after separation therefrom of metal parts, coarse material and material in sheet form, said organic fraction having a screen analysis as follows (% by weight)

particle size	<4 mm	60-75%
particle size	4-6 mm	25-35%
particle size	6-30 mm	4-10%
particle size	>—10 mm	absent

and having a moisture content of 25 to 50% by weight, and being substantially free from glass particles of size greater than 2 mm, shaping said moisture into a body, and drying and firing the shaped body.

4,438,056

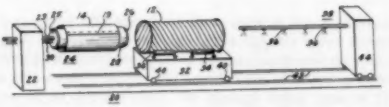
METHOD FOR PRODUCING A CORRUGATED PIPE HAVING A SMOOTH LINING OF FOAM PLASTIC

Bernard J. Bast, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 166,660, Jul. 7, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,214

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—45.2 7 Claims



1. A method for producing a smooth-lined corrugated pipe which comprises:

(a) applying a plastic foaming mixture to the internal surface of a corrugated pipe progressively along its entire length,

(b) pressing a sheet liner in the form of an expandable cylinder against the plastic foaming mixture, and

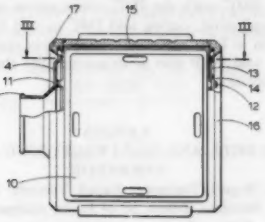
(c) maintaining the pressure until the foaming mixture has substantially solidified.

4,438,057

AIR FILTERS

Jarl Sundseth, 23 Lennox Gardens, London S.W. 1, England

Filed Jul. 21, 1981, Ser. No. 285,473
Claims priority, application United Kingdom, Jul. 23, 1980, 8024020; Feb. 3, 1981, 8103255
Int. Cl.³ B29C 27/00
U.S. Cl. 264—46.5 4 Claims



1. A method of making a filter element of the type employing a block of deep pleated paper comprising the steps of

providing bottom and top end support members of relatively rigid material each end member having a rectangular peripheral portion defined by first and second pairs of opposed peripheral edges and, within it, an opening for air flow,

providing a first pair of side walls, the first pair of edges of the peripheral portion of the members and the end edges of the first pair of side walls being connected by hinge connections along at least two pairs of adjacent edges,

placing the bottom and top members and said first pair of walls around a block of deep pleated paper with the sides of the pleats extending generally parallel to the first pair of side walls,

connecting the previously unconnected pair or pairs of edges of said members and first pair of side walls, the connection being formed by interengaging elements at the adjacent edges,

forming from an elastomeric material settable in situ a second pair of side walls extending over and sealing the ends of the pleats of the block, the second pair of side walls extending between the end members at corresponding opposite, second edges of their peripheral portions and between the adjacent side edges of the first pair of side walls with which they effect a seal, and

forming also from an elastomeric material settable in situ peripheral flanges at the first pair of peripheral edges of the peripheral portion of both end members in sealing relationship with the adjacent edges of the first pair of side walls, the flanges sealing the side pleats of the pleated paper, and embedding the interengaging elements.

4,438,058

EXPANDING PROCESS

Yoshio Tanaka, No. 7-6, Shibuya 2-Chome, Shibuya-ku, Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 356,240
Claims priority, application Japan, Mar. 9, 1981, 56-33550
Int. Cl.³ B29D 27/00
U.S. Cl. 264—51 11 Claims

1. Process for blowing expandable resin particles, which comprises expanding said resin particles in the presence of surfactant in an amount of 0.5 to 10% by weight based on the particles.

4,438,059

ELECTRICALLY CONDUCTIVE FIBER GLASS ARTICLES AND SHEETS

Robert E. Mollman, Moreland Hills, Ohio, and Ralph Silva, Springboro, Pa., assignors to Molded Fiber Glass Companies, Ashtabula, Ohio

Filed Sep. 22, 1982, Ser. No. 421,530
Int. Cl.³ B29G 1/00
U.S. Cl. 264—105 6 Claims

1. A method of making an electrically conductive laminate comprising,

providing a thermoset resin,

adding sufficient carbon black to the material to give the material the desired electrical conductivity,

adding a pigmentation material to said carbon black and polymer to partly overcome the pigmentation effect of the carbon black,

mixing said carbon black and pigmentation material,

said pigmentation material being in the form of titanium dioxide in the amount of 15% to 30% by weight, to completely disperse the carbon and pigment in the resin,

and adding a catalyst to the material to form a paste, adding the paste to fiber glass and curing the resin.

4,438,060

PROCESS FOR PRODUCING CROSS-SECTIONALLY STABLE, HYGROSCOPIC FIBERS AND FILAMENTS HAVING A CORE-JACKET STRUCTURE

Ulrich Reinehr; Toni Herbertz, both of Dormagen, and Hermann-Josef Jungverdorben, Grevenbroich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 210,467
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1979, 2947824
Int. Cl.³ D01F 6/18
U.S. Cl. 264—206 5 Claims

1. A process for the production of hygroscopic polyacrylonitrile filaments with fibers containing at least 80% by weight of acrylonitrile units which filaments or fibers have a core-jacket structure and uniform round to oval cross-sectional profiles from hydrophobic, filament forming synthetic polyacrylonitrile polymer containing at least 80% by weight of acrylonitrile units by a dry-spinning process which comprises addition of a substance to the spinning solvent which

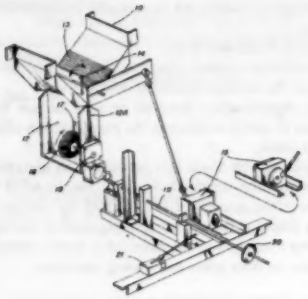
a. has a higher boiling point than the spinning solvent used,
b. is readily soluble with the spinning solvent and with water,
c. is a non-solvent of the polymer to be spun; and
d. is selected from the group consisting of polyhydric alcohols, sugars and glycols, and addition of another substance which
a. is soluble in the non-solvent of the polymer to be spun
b. is soluble in the solvent to the polymer
c. remains dissolved in the non-solvent for the polymer during solidification of the filaments,
d. is insoluble in water,
e. does not evaporate to any significant extent during the spinning process, and
f. is selected from the group consisting of polycarbonate, polystyrene, polyvinyl acetate and cellulose acetate to the system in quantities of 1 to 5% by weight, based on polymers solid/spinning/non-solvent, carrying out the spinning process in such a way that the non-solvent does not evaporate to any significant extent in the spinning duct and washing out the non-solvent from the solidified filaments.

4,438,061

TUBE INSERTING MACHINE

Simon J. Richter, Marietta, Ga., and Ardashus A. Aykanian, Rancho Palos Verdes, Calif., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 23, 1982, Ser. No. 444,358
Int. Cl.³ B29C 6/02
U.S. Cl. 264—249 35 Claims



1. An apparatus for automatically inserting a tubular article within each of a sequence of containers at the same predetermined positions therein comprising:

means for sequentially conveying said containers through a work station;

means for temporarily arresting the conveyance of said containers when any one of said containers reaches said work station;

means for supporting a supply of tubular articles at a transfer station adjacent said work station; and

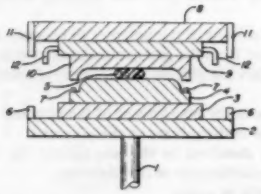
reciprocating rod means for engaging a tubular article at said transfer station and carrying said tubular article therewith into said predetermined position within a container at said work station as said rod means moves in a forward direction, and leaving said tubular article at said predetermined position as said rod means moves in a reverse direction.

4,438,062

IN-MOLD COATING METHOD

Richard M. Griffith, and Henry Shanoski, both of Akron, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Apr. 14, 1983, Ser. No. 484,760
Int. Cl.³ B29C 1/00, 9/00
U.S. Cl. 264—255 2 Claims



1. The method which comprises, in a heated compression mold having two halves forming a cavity for molding, (1) placing a SMC (sheet molding compound) charge in the cavity of one of said mold halves, (2) forcing one of said halves against the other while providing essentially parallelism between the mold halves as the mold is closed to spread the SMC throughout the mold, to mold the SMC and substantially to cure the SMC to form a molded FRP (glass fiber reinforced plastic) part, (3) slightly separating said mold halves and injecting an IMC (in-mold coating) composition onto the outer surface of the FRP part, (4) reclosing the mold halves while, in substantially the first or initial portion of said mold reclosing, skewing one of said mold halves relative to the other to effect a scissoring action between the mold halves with the fulcrum being essentially at about said IMC injection port and where said IMC was injected in order or sweep or wipe said IMC composition across the surface of the SMC part and, in the latter portion of said mold reclosing, effecting at least substantial parallelism between the mold halves to complete the coating of the SMC with the IMC composition, and (5), in said finally closed mold, curing said IMC to said FRP, said IMC composition at least essentially completely coating the outer surface of said FRP part with a minimum thickness of said IMC composition.

4,438,063

PRESS ROLL AND MANUFACTURING METHOD THEREFOR

Masayoshi Suguri, Fujisawa; Kazuo Yamada, Kawasaki, and Masaaki Nandate, Tokyo, all of Japan, assignors to Kinyosha Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,139
Int. Cl.³ C08K 3/34
U.S. Cl. 264—311 10 Claims

1. A press roll, comprising:

an inorganic stone powder containing as a main component SiO_2, Al_2O_3, or a mixture of SiO_2 and Al_2O_3; and,

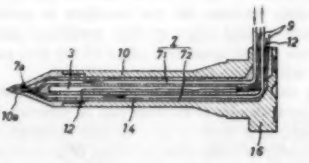
a non-cellular polyurethane having a Shore D hardness of over 70° which is obtained by reacting an organic isocyanate with one or more organic compounds having a functional group which reacts with said isocyanate, wherein at least 10% by weight of said organic compounds comprises a polyether having more than three functional groups.

4,438,064

INJECTION MOLDING PROCESS FOR SYNTHETIC RESIN AND ITS APPARATUS

Shigeru Tsutsumi, Yonezawa, Japan

Filed Nov. 10, 1982, Ser. No. 440,569
Claims priority, application Japan, Nov. 20, 1981, 56-185450
Int. Cl.³ B29F 1/03, 1/08
U.S. Cl. 264—328.15 4 Claims



1. A process for injection molding a fused synthetic resin into a cavity comprising the steps of:

heating and fusing a synthetic resin in a runner and a gate which communicate with each other;

injecting fused synthetic resin from said runner and gate into a cavity which communicates with said gate; and

forcibly supplying a cooling medium into a cooling chamber projecting into the runner and the interior of the gate;

whereby the fused synthetic resin is cooled and solidified within the gate to close the gate after the resin has been injected into the cavity.

2. An injection molding apparatus for synthetic resin comprising:

a pair of molds defining a cavity;

a gate communicating with said cavity;

a runner communicating with said gate;

heater means for heating and fusing resin in the gate and the runner;

cooling means disposed in said runner and extending into said gate for locally cooling the area of the gate; and

actuating means to actuate the cooling means every time an injection molding operation is carried out whereby fused resin in the gate can be cooled and solidified in order to close the gate.

4,438,065

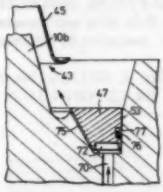
AIR EJECTION OF MOLDED CONTAINERS

Paul Brown, Orangeville, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Mar. 8, 1982, Ser. No. 355,891

Int. Cl.³ B29C *7/00*

U.S. Cl. 264—335 **3 Claims**



1. A method of operating an injection-molding apparatus for ejecting a cup-shaped workpiece with a closed front end and a rearwardly facing rim from a tapering core around which the workpiece has been molded with said rim resting on an annular zone surrounding said core, comprising the steps of:

(a) directing a first stream of a gaseous fluid from the surface of said core into the interior of a freshly molded workpiece for initiating a separation of said workpiece from said core, thereby creating a peripheral gap therebetween; and

(b) thereafter directing a second stream of a gaseous fluid from said annular zone forwardly toward said rim for completing the separation of said workpiece from said core.

4,438,066

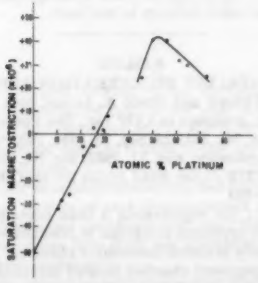
ZERO TO LOW MAGNETOSTRICTION, HIGH COERCIVITY, POLYCRYSTALLINE, CO-PT MAGNETIC RECORDING MEDIA

Joseph A. Aboaf, Peekskill, N.Y.; Erik Klokholm, Stamford, Conn., and Sigrid R. Herd, Pawling, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,144

Int. Cl.³ C22C *19/07*

U.S. Cl. 420—435 **12 Claims**



1. A thin film magnetic recording medium for recording magnetic transitions representative of data said thin film magnetic recording medium consisting of a sputtered polycrystalline film of Co and Pt, having a magnetostriction value of from about -35×10^{-6} to a smaller positive value near substantially zero magnetrostriction to about $\pm10\times10^{-6}$ in accordance with the formula Co_xPt_y where x (Co) is up to about 90 at. % of said material and the value y (Pt) is within the range of about 10 to about 30 at. % of said material whereby alteration of the magnetic state of said material in response to extraneous mechanical forces is averted.

4,438,067

TEST STRIPS FOR ANALYZING DISSOLVED SUBSTANCES

Iqbal Siddiqi, Veyrier, Switzerland, assignor to Battelle Memorial Institute, Switzerland

Continuation of Ser. No. 193,271, filed as PCT EP/00035, May 16, 1979, published as WO 79/01081, Dec. 13, 1979, § 102(e) date Dec. 27, 1979, abandoned. This application Apr. 28, 1982, Ser. No. 372,796

Claims priority, application Switzerland, May 17, 1978, 5334/78

Int. Cl.³ G01N *21/78*; C12Q *1/54, 1/26, 1/28, 1/30*; C12N *11/04*; G01N *35/22*

U.S. Cl. 422—56 **7 Claims**

1. A test strip for analyzing for a substance dissolved in an aqueous test solution which can be a biological fluid, said test strip comprising:

an inert nonabsorbent base strip forming a support; and

a layer of solid spherical hydrophilic beads composed of a semipermeable polymer and coated onto and bonded to at least one surface of said support, said beads being in mutually contacting relationship in said layer to define pockets between mutually contacting beads and said support in which reproducible quantities of aqueous test solution can be retained, said beads being formed with microvacuoles containing at least one reagent located within the beads and retained therein such that said substance or a compound generated by said substance can penetrate into said beads to effect a color-change of said beads.

a plurality of reagents being provided in said beads at sites and under conditions such that the different reagents are held apart during storage and being allowed to react mutually only upon contact with said test solution.

4,438,068

TEST-TUBE ASSEMBLY FOR IMMUNOASSAYS UTILIZING MAGNETICALLY ATTRACTABLE PARTICLES

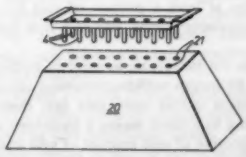
Gordon C. Forrest, Ingatestone, England, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Nov. 12, 1980, Ser. No. 206,245

Claims priority, application United Kingdom, Nov. 13, 1979, 7939214

Int. Cl.³ G01N *33/54*

U.S. Cl. 422—61 **14 Claims**



1. A two-part test-tube assembly for use in immunoassays utilising magnetically attractable particles, which comprises:

(a) a plurality of test-tubes mounted in a planar support member and fixedly held relative thereto, and the lower portions of the tubes projecting below the support member by a fixed distance; and

(b) a substantially planar base member having magnet means permanently located therein;

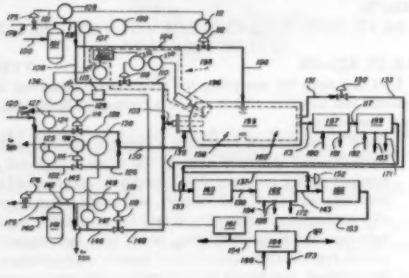
the support member and the base member being releasably couplable together to form a unitary assembly in which the bottoms of the test-tubes are held adjacent the base member, the assembly being manually invertable (in use) whilst remaining unitary to decant liquids from the tubes whilst retaining magnetically attractable particles within said tubes under the influence of the magnet means.

4,438,069

SYSTEM FOR TEMPERATURE CONTROL OF A CLAUS SULFUR UNIT THERMAL REACTOR

Lee G. Peterman, Flossmoor, Ill., and Raymond J. Staebel, Houston, Tex., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 30, 1981, Ser. No. 335,912
Int. Cl.³ G01N *33/00*
U.S. Cl. 422—62 **6 Claims**



1. A sulfur plant for converting hydrogen sulfide into water and elemental sulfur comprising:

at least two successive reaction zones, which are a first reactor zone adapted to receive a first hydrogen sulfide-containing stream and a molecular oxygen-containing stream and a second reaction zone adapted to receive a first reaction product stream from said first zone and a second hydrogen sulfide-containing stream, where in said first reaction zone said first hydrogen sulfide-containing stream is contacted during operation with said molecular oxygen containing stream at conditions sufficient to oxidize hydrogen sulfide to form said first reaction product stream containing sulfur dioxide, which is a reaction product of at least a portion of hydrogen sulfide in said hydrogen sulfide-containing stream and molecular oxygen in said molecular oxygen-containing stream, and where in said second zone, said first reaction product stream is contacted with a second hydrogen sulfide-containing stream at conditions sufficient to form a second reaction product stream containing water and elemental sufur made from at least a portion of said second hydrogen sulfide-containing stream and said first reaction product stream;

a first means for measuring amount of hydrogen sulfide in said first hydrogen sulfide-containing stream which during operation would enter said first reaction zone and transmitting to a third means a hydrogen sulfide-amount signal indicative of said amount of said hydrogen sulfide;

a second means for measuring amount of molecular oxygen which during operation would enter said first reaction zone and transmitting to said third means a molecular oxygen-amount signal indicative of said amount of said molecular oxygen;

a said third means for comparing said hydrogen sulfide-amount signal and said molecular oxygen-amount signal and for transmitting to a fifth means a comparison signal dependent, at least in part, upon both said hydrogen sulfide-amount signal and said molecular oxygen-amount signal;

a fourth means for determining temperature within said first reaction zone and for transmitting a temperature signal indicative of said temperature to said fifth means;

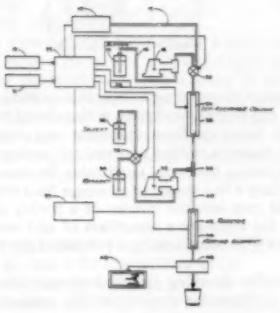
a said fifth means for varying relative amount of hydrogen sulfide to molecular oxygen which during operation would enter said first reaction zone in response to two signals: said temperature signal and said comparison signal; whereby a temperature control strategy can be followed to maintain temperature in the first reaction zone to some desired value.

4,438,070

PACKED COLUMN THERMAL REACTOR FOR AN ANALYTICAL INSTRUMENT

Donald E. Stephens, Palo Alto, and Thomas D. Sharples, Atherton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 4, 1981, Ser. No. 327,379
Int. Cl.³ G01N *31/08*
U.S. Cl. 422—70 **1 Claim**



1. A reactor for an automated analyzer, said reactor comprising:

an elongate straight column including an interior surface defining a column bore;

a noble metal electroplated onto said interior surface;

externally threaded fittings on each end of said column for establishing fluid communication between said bore and said analyzer, said fittings being no wider than the width of said column;

a pluarality of inert particles packed within said bore; and

a packing support disc at each end of said column, said packing support disc having a plurality of small openings therein to allow fluid passage from one side of said disc to the other side of said disc, said openings small enough to retain said inert particles in said bore.

4,438,071

FLUID CATALYST REGENERATION APPARATUS

Anthony G. Vickers, and David A. Lomas, both of Arlington Heights, Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 301,923, Sep. 14, 1981, Pat. No. 4,364,849.
This application Aug. 12, 1982, Ser. No. 407,681
Int. Cl.³ F27B *15/08*; B01J *21/20, 29/38*; C10G *11/18*
U.S. Cl. 422—109 **5 Claims**

1. Apparatus for regenerating a coke contaminated, fluid catalyst which apparatus comprises in combination:

(a) a vertically oriented combustion chamber;

(b) a disengagement chamber located superadjacent to and above said combustion chamber;

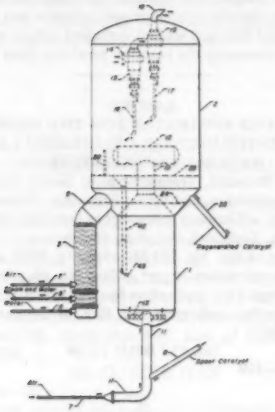
(c) a high level catalyst collection section at the bottom of said disengagement chamber;

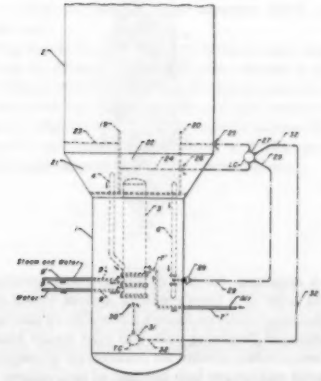
(d) a first conduit effecting communication between said

combustion chamber and said disengagement chamber having at least one outlet opening positioned above said high level catalyst collection section so that catalyst will flow from said first conduit into said high level catalyst collection section;

(e) a low level catalyst collection section at the bottom of said disengagement chamber separated from said high level catalyst collection section by means of baffles such that the level of a fluidized catalyst bed filling said high level catalyst collection section will be maintained higher than the level of a fluidized catalyst bed maintained in said low level catalyst collection section;

(f) a shell and tube heat exchanger of vertical orientation,





remote from said combustion and disengagement chamber, having a catalyst inlet in the shell side of said heat exchanger and the upper end of the shell being in open communication with the bottom of said low level catalyst collection section;

(g) a hot catalyst conduit connecting said high level catalyst collection section of said disengagement chamber with said shell side heat exchanger inlet, such that hot regenerated catalyst can flow from said disengagement chamber to said heat exchanger;

(h) a cooled catalyst conduit connecting the bottom of said low level catalyst collection section with a lower portion of said combustion chamber, such that cooled catalyst which overflows from said shell side of said heat exchanger into said low level catalyst collection section can flow to said lower portion of said combustion chamber;

(i) a fluidizing gas inlet conduit connected to a bottom portion of the shell side of said heat exchanger, such that fluidizing gas can pass into said shell side and maintain a fluidized catalyst bed therein;

(j) inlet and outlet conduits connected to said tubes of said heat exchanger, such that a cooling fluid can flow through said tubes.

4,438,072

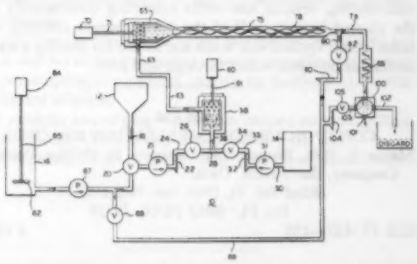
CONTINUOUS STREAM MIXER HAVING VARIABLE DWELL TIME CHAMBER WITH AUGER

Joseph L. Nothnagel, Saukville, Wis., assignor to Freeman Chemical Corporation, Port Washington, Wis.

Filed Feb. 22, 1982, Ser. No. 350,861

Int. Cl.³ C08J *9/00;* **B01F** *13/10, 15/04;* **B29D** *27/02*

U.S. Cl. 422—133 **8 Claims**



1. An apparatus for mixing together materials which are reactive with one another, said apparatus comprising:

a source of a first material;

a source of a second material;

a source of a third material;

first and second conduit means coupled respectively to said first and second sources of material and means for conveying said materials from said sources through said conduit means and controlling the quantity of material conveyed from said sources;

mixing conduit means coupled to said first and second conduit means;

mixing means coupled to said mixing conduit means whereby said materials are mixed together;

an elongate, generally cylindrical dwell chamber coupled to said mixing means whereby mixed materials flowing therethrough will react for a time dependent on the length of said dwell chamber;

a dispensing means coupled to said dwell chamber;

a third conduit means coupled to said source of said third material and to said dispensing means;

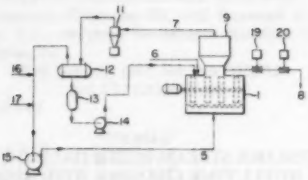
said dispensing means including valve means arranged to permit said mixed material to be selectively discharged therefrom to two separate locations through two pathways established within said valve means,

said third conduit means being coupled to said valve means in such a manner that said third material may be selectively flowed through either of said pathways whereby mixed material may be washed from one pathway while the other pathway is used for discharge of said material.

4,438,073
VAPOR PHASE POLYMERIZATION APPARATUS FOR OLEFINS

Kunimichi Kubo, Tokyo; Yasunosuke Miyazaki, Machida; Mamoru Yoshikawa, Kawasaki, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,616
Claims priority, application Japan, Oct. 31, 1980, 55-152224
Int. Cl.³ B01J *12/02*
U.S. Cl. 422—135 **7 Claims**

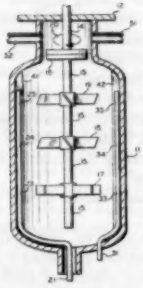


1. In a vapor phase polymerization apparatus for olefins constituted by a horizontal type hollow cylindrical vessel having a centrally located driving shaft, the improvement comprising a plurality of cells whose upper portions are open to the inner surface of the lower portion of said vessel, said cells having vertical side walls extending downwardly from the curved bottom wall of the vessel, means defining small holes in said vertical side walls and means for feeding a starting olefin gas into said vessel through said cells.

4,438,074
CONTINUOUS POLYMERIZATION REACTOR

Mason S. Wilt, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1981, Ser. No. 285,644
Int. Cl.³ B01J *14/00, 19/18*
U.S. Cl. 422—135 **6 Claims**



1. A reactor for contacting olefinic monomer and initiator in a continuous polymerization process, said reactor comprising:

a vessel, having an upper portion and a lower portion, wherein a longitudinal axis extends from said lower portion to said upper portion;

radial turbine means for creating a first turbulent zone in said vessel;

a first axial turbine means for creating a second turbulent zone in said vessel;

a first conduit means extending from the lower portion of said vessel to the upper portion of said vessel substantially along a first portion of the wall of said vessel, wherein said first conduit means has a fluid outlet at the position of said means for creating said first turbulent zone and at the position of said means for creating said second turbulent zone;

means for introducing said olefinic monomer into said first conduit means to thereby introduce said olefinic monomer into the periphery of said first and second turbulent zones;

a second conduit means extending from the lower portion of said vessel to the upper portion of said vessel substantially along a second portion of the wall of said vessel, wherein said second conduit means has a fluid outlet at the position of said means for creating said first turbulent zone and at the position of said means for creating said second turbulent zone, wherein said first portion of the wall of said vessel is substantially diametrically opposed to said second portion of the wall of said vessel;

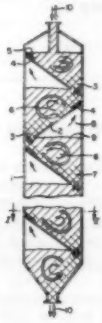
means for introducing initiator into said second conduit means to thereby introduce said initiator into the periphery of said first and second turbulent zones; and

means for removing the reaction products from said vessel.

4,438,075
PROCESS AND APPARATUS FOR THE PRODUCTION AND MAINTENANCE OF A FLUIDIZED LAYER IN HETEROGENEOUS SYSTEMS

Helmut von Branchel, Troisdorf-Spich; Georg Schreiber, Cologne-Rodenkirchen, and Heinz Schroeder, Witten/Ruhr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 713,583, Aug. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 681,474, Apr. 29, 1976, abandoned. This application Jun. 5, 1978, Ser. No. 912,309
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1975, 25189757
Int. Cl.³ B01D *11/04*
U.S. Cl. 422—189 **5 Claims**



3. An apparatus for the production and maintenance of a fluidized layer in a heterogeneous system which comprises a vertical contact column having a plurality of successive, vertically arranged fluidizing cells and inlet means located at one end of said contact column for cocurrently introducing a liquid and a solid and/or gas into one end of said column to provide a heterogeneous mass stream containing the liquid as a continuous phase and the solid and/or gas as the disperse phase, the continuous phase having a density different than that of said disperse phase, a plurality of plates arranged superimposed and inclined in opposition to each other with respect to a horizontal plane, each of said plates covering the inside cross-section of the column in each two plates inclined in opposition to another forming a fluidizing cell therebetween; in the region of the lower end of each plate a fluid flow connecting means placing the space above the plate in communication with the space below the plate and in the region of the upper end of each of the plates, a discharge means for discharging a portion of the heterogeneous mass stream from a space below the plate and having a flow resistance different from the flow resistance

of said fluid flow connecting means, the difference in flow resistance between the fluid flow connecting means and the discharge means providing means for establishing a pressure gradient across each plate positioned between two fluidizing cells, whereby the heterogeneous mass stream is caused to flow from one fluidizing cell to the next fluidizing cell with a vertical rotational motion being imparted to the heterogeneous mass stream within each of the fluidizing cells of the column, said motion being further promoted by the force of gravity due to the difference in density of the continuous and disperse phases, another inlet means for introducing a gas into the space above the lower plate of the two plates providing a fluidizing cell therebetween, said another inlet means directing the gas along said lower plate and means located at the other end of said column for discharging a resultant homogeneous mass stream from the other end of said column.

4,438,076

METHOD OF EXTRACTING GOLD AND SILVER FROM AN ORE

Hartmut Pietsch, Bad Homburg; Wolfgang Türke, Schöneck; Ernst Bareuther, Butzbach; Fritz Kümpf, and Hubert Bings, both of Lünen, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main and Vereinigte Aluminum-Werke AG, Bonn, both of, Fed. Rep. of Germany

Continuation of Ser. No. 391,959, Jun. 24, 1982, abandoned.

This application Aug. 12, 1983, Ser. No. 523,022

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126234

Int. Cl.³ C22B *11/08*

U.S. Cl. 423—30 **8 Claims**

1. A method of recovering at least one element selected from the group which consists of gold and silver from an ore containing same, comprising the steps of:

forming a slurry of the ore in an aqueous alkali cyanide solution; and

maintaining said slurry in a turbulent state at a pressure of 25 to 130 bar by passing it through a tube reactor in continuous unidirectional flow, while injecting oxygen of a purity of at least 90% into said slurry in said tube reactor at said pressure so that the CN/O_2 molar ratio is at most 0.7 at 25 bar and 0.7 g/l NaCN and is lower at higher pressures whereby said element is leached from said ore.

4,438,077

TWO STAGE SELECTIVE OXIDATIVE LEACH METHOD TO SEPARATELY RECOVER URANIUM AND REFRACTORY URANIUM-MINERAL COMPLEXES

Tien-Fung Tsui, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,419

Int. Cl.³ C01G *43/00, 31/00*; C22B *60/02, 34/22*

U.S. Cl. 423—7 **19 Claims**

1. An improved process for the recovery of uranium and other minerals from uranium ore wherein part of the uranium is present as refractory uranium-mineral complexes, the process comprising;

a. subjecting the uranium ore to mild oxidative carbonate leach fluid to dissolve and remove uranium values other than the refractory uranium-mineral complexes;

b. subsequently subjecting the uranium ore to an oxidative chemically severe acid leach system to dissolve and remove the refractory uranium-mineral complexes; and

c. separating and recovering the uranium and other mineral species in the leachate fluids.

4,438,078

RECOVERY OF GADOLINIUM AND GALLIUM OXIDES

David Nalewajek, West Seneca, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 20, 1982, Ser. No. 451,296

Int. Cl.³ C01G *15/00*; C01F *17/00*

U.S. Cl. 423—21.5 **7 Claims**

1. A method for recovering gadolinium and gallium oxides from by-product material which contains both of these oxides and various impurities comprising the steps of:

(a) dissolving the gadolinium and gallium oxide in a strong mineral acid that does not yield compositions which react adversely with an ion exchange resin used in separation of the gallium oxide,

(b) filtering the solution of (a), isolating the filtrate, adding a compound generating oxalic acid ion and precipitating the gadolinium as oxalate from said filtrate,

(c) separating, washing and drying the precipitated gadolinium oxalate,

(d) converting the gadolinium oxalate salt from step (c) by calcining the recovered gadolinium oxalate to yield gadolinium oxide,

(e) contacting the filtrate from step (b) with an ion exchange resin containing a quaternary ammonium functionality, eluting the resin with an acid having a concentration in the range 6–12 N and thereafter eluting the resin with an acid having a concentration of about 1 N to elute the gallium fraction,

(f) reacting the filtrate containing the gallium fraction eluted in step (e) with a compound generating oxalic acid ion and precipitating the gallium oxalate by basifying the acidic filtrate solution,

(g) washing and drying the gallium oxalate salt and gallium hydroxide which precipitates from step (f), and

(h) calcining the precipitate of step (g) to form gallium oxide.

4,438,079

METHOD FOR MANUFACTURE OF ARSENIOUS ANHYDRIDE

Tadashi Nakano; Hiroyuki Tamura, and Naoki Kubo, all of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,154

Claims priority, application Japan, Mar. 30, 1981, 56-454443; Sep. 11, 1981, 56-142485

Int. Cl.³ C01B *27/00, 29/00*

U.S. Cl. 423—87 **26 Claims**

1. A method of manufacturing arsenious anhydride from an arsenic sulfide-containing substance, said method comprising the steps of

(a) extracting arsenic from the arsenic sulfide-containing substance by contacting the arsenic sulfide-containing substance with a copper sulfate-containing aqueous solution to thereby produce an extract solution containing arsenious acid together with an extraction residue,

(b) oxidizing the extract solution obtained in step (a) in the presence of at least 1 g/l of copper ions to convert most of the arsenious acid therein to arsenic acid and thereby provide an oxidized solution,

(c) contacting the oxidized solution obtained in step (b) with a weak reducing agent to form crystals of arsenious anhydride, and

(d) recovering said crystals of arsenious anhydride formed in step (c).

4,438,080

PROCESS FOR OXIDIZING THALLIUM (I) TO THALLIUM (III)

Bruce K. McEuen, Hopewell, and Robert D. Norris, Cranbury, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 6, 1982, Ser. No. 447,367

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—112 **9 Claims**

1. In the process for oxidizing ions of thallium (I) contained in a reaction solution to thallium (III) using hydrogen peroxide as the oxidizing agent wherein the improvement comprises removing at least part of the thallium (III) from the reaction solution during the oxidation process.

4,438,081

PROCESS FOR THE PURIFICATION OF CYCLIC CHLOROPHOSPHAZENES

Hans-Peter Rieck, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,882

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144751

Int. Cl.³ C01B *25/10*

U.S. Cl. 423—300 **16 Claims**

1. A process of substantially suppressing or completely preventing a change of color during polymerization of an oligomeric chlorophosphazene of the formula

$(N{=}PClR)_n$

in which n is an integer of from 3 to 8, and

R is phenyl, C_1–C_6-alkyl, or chlorine, which comprises treating the oligomeric chlorophosphazene with sulfur dioxide or a sulfur oxide chloride.

4,438,082

PLATINUM GOLD CATALYST FOR REMOVING NO_x AND NH_3 FROM GAS STREAMS

Joseph C. Dettling, Jackson; William F. Carr, Monmouth Junction; Ronald M. Heck, Frenchtown, and James M. Chen, Rahway, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Sep. 30, 1982, Ser. No. 430,450

Int. Cl.³ C01B *21/00, 21/26*; B01J *8/00, 8/02*

U.S. Cl. 423—235 **7 Claims**

1. A process for reducing oxides of nitrogen while maintaining an effluent free of ammonia in a gas stream containing at least about 0.8 moles of ammonia for each mole of NO_x present, at least 2 mole % of oxygen, comprising the step of passing the gas stream over a catalyst containing an amount of noble metal which is effective to catalyze the reduction of nitrogen oxides to nitrogen, wherein the noble metal consists essentially of from about 0.001 to about 5.0 percent platinum and from about 0.0005 to about 2.5 percent gold by weight of support and noble metal and the temperature of the gas stream is maintained within a range in which the noble metal catalyst is effective to decompose ammonia.

4,438,083

PROCESS FOR PREPARING MAGNESIUM NITRATE HEXAHYDRATE AND FOR THERMALLY STABILIZING AMMONIUM NITRATE USING MAGNESIUM NITRATE HEXAHYDRATE

Michael H. Willems, and Winfried J. W. Vermijs, both of Geleen, Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 15, 1982, Ser. No. 418,547

Claims priority, application Netherlands, Sep. 17, 1981, 8104284

Int. Cl.³ C01F *11/14*

U.S. Cl. 423—266 **9 Claims**

1. Process for preparing pure magnesium hexahydrate suitable as a stabilizer for thermally stable ammonium nitrate granules by reacting magnesium oxide or magnesium carbonate with nitric acid in the presence of water, comprising the combination of steps of:

(a) forming a suspension of magnesium oxide or magnesium carbonate in melted magnesium nitrate hexahydrate at a suspension temperature in excess of 90° C. up to about 120° C.;

(b) adding a nitric acid solution to said suspension at a temperature in excess of about 90° C. and up to about 120° C. while stirring said suspension to obtain a liquid reaction mixture, whereby additional magnesium nitrate hexahydrate is formed in said mixture, said nitric acid solution having a concentration of about 53 weight percent to about 58 weight percent acid;

(c) filtering said liquid reaction mixture at a temperature in excess of about 90° C. and up to about 120° C. to obtain a clear magnesium nitrate hexahydrate filtrate; and

(d) discharging as a product fraction a quantity of said clear filtrate approximately corresponding to the amount of magnesium oxide or magnesium carbonate introduced in step (a).

4,438,084

MANUFACTURE OF HYDROXYLAMMONIUM SALTS

Guenther Rapp, Ludwigshafen; Erwin Thomas, Freinsheim, and Rolf Muenster, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 119,927, Feb. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 942,890, Sep. 18, 1978, abandoned. This application Dec. 17, 1982, Ser. No. 450,581

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743346

Int. Cl.³ C01B *21/20*

U.S. Cl. 423—387 **6 Claims**

1. A process for the manufacture of hydroxylammonium salts conducted in a passivated reaction vessel which is noncorroding, insensitive to impact and shock, resistant to aging and easily processable, which possesses high mechanical strength and which does not release materials detrimental to the course of reaction into solution; said process comprising the catalytic reduction of nitric oxide with hydrogen in a dilute aqueous mineral acid in the presence of a suspended platinum catalyst at an elevated temperature in a passivated reaction vessel, wherein the walls of the reaction vessel consist of essentially copper-free molybdenum-containing austenitic chromium-nickel steel, which consists of from 16 to 28% by weight of chromium, from 10 to 50% by weight of nickel, from 1 to 4% by weight of molybdenum, at most 0.05% by weight of carbon, and 0.12% to 0.5% by weight of nitrogen, remainder iron said reaction vessel having been passivated by exposure to the process for the manufacture of hydroxylammonium salts for about 200 hours, whereby no materials detrimental to the course of reaction are released on exposure to the process.

4,438,085

PREPARATION OF DIHYDROXYALUMINIUM SODIUM CARBONATE

Jeffrey L. Kaufman, Mulgrave, Australia, assignor to Nicholas Proprietary Limited, Victoria, Australia

PCT No. PCT/AU81/00036, § 371 Date Nov. 23, 1981, § 102(e) Date Nov. 23, 1981, PCT Pub. No. WO81/02728, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 26, 1981, Ser. No. 325,422

Claims priority, application United Kingdom, Mar. 28, 1980, 8010521

Int. Cl.³ C01F *7/00*; A61K *33/06, 33/08, 33/10*

U.S. Cl. 423—419 P **13 Claims**

1. A method of preparing dihydroxyaluminum sodium carbonate, which comprises:

synthesizing said dihydroxyaluminum sodium carbonate by

reacting an aluminum salt selected from the group consisting of aluminum chloride, aluminum nitrate, aluminum sulfate, aluminum acetate and alum with a stoichiometric excess of sodium carbonate in a ratio of at least 10 parts by weight sodium carbonate to said aluminum salt in a basic aqueous medium containing sodium hydroxide in an amount sufficient to ensure the presence of no sodium bicarbonate in solution but in an amount which does not permit the pH of the solution to exceed 10.5 at a temperature ranging from 40° to 80° C.;

precipitating dihydroxyaluminum sodium carbonate and the salt formed from sodium ion and the anion of the aluminum salt reactant from the aqueous medium with substantially all of the unreacted sodium carbonate being retained in the aqueous medium at least until separation of said precipitated sodium salt is effected; and

washing said precipitated dihydroxyaluminum sodium carbonate free of coprecipitated sodium salt, thereby obtaining the desired dihydroxyaluminum sodium carbonate product.

4,438,086

METHOD FOR PREPARATION OF GRAPHITE FLUORIDE BY CONTACT REACTION BETWEEN CARBON AND FLUORINE GAS

Minoru Aramaki; Yasushi Kita; Hishagi Nakano, and Shiro Moroi, all of Ube, Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Sep. 1, 1982, Ser. No. 413,889

Claims priority, application Japan, Sep. 2, 1981, 56-136963

Int. Cl.³ C01B *31/04, 9/08, 31/30*

U.S. Cl. 423—448 **15 Claims**

1. A method of preparing a graphite fluoride, which is expressed by $(CF_x)_n$ where x is in the range from 0.1 to 1.4, by heterogeneous contact reaction between a solid carbon material and fluorine gas, the method comprising the steps of:

placing a carbon material in the form of pieces smaller than about 10 mm in or on a holder so as to form a layer of the carbon material in or on said holder, said holder having a plurality of openings through which said fluorine gas can permeate into and pass through said layer of the carbon material;

introducing said holder into a reaction vessel such that gas passages are left around said holder; and

keeping the carbon material in or on said holder heated at a temperature in the range from about 200° C. to about 550° C. without agitating said carbon material and, simultaneously forcibly passing said fluorine gas through said gas passages in the reaction vessel thereby allowing a portion of said fluorine gas to permeate into said layer of the carbon material through said openings of the holder and pass through said layer, whereby said reaction takes place not only at the surfaces of said layer of the carbon material but also in the interior of said layer.

4,438,087

CARBON BLACK PROCESS

John R. Casperson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 274,029, Jun. 16, 1981, Pat. No. 4,406,862. This application Sep. 29, 1982, Ser. No. 427,248

Int. Cl.³ C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—450 **10 Claims**

1. A method for producing negative tint residual carbon black comprising

(1) introducing carbon black reactants under carbon black producing conditions into a carbon black reactor said carbon black reactor comprising:

(a) a mixing section with conduit means for the introduction of reactants;

(b) a reaction section positioned downstream of the mixing section and in open communication therewith;

(c) a choke positioned within said reactor; and

(d) means for producing reciprocating movement of said choke along the longitudinal axis of said reactor during operation of said reactor; and

(2) reciprocating said choke while producing carbon black said reciprocation sufficient to disrupt flow of reactants.

4,438,088

PREPARATION OF ANTIMONY TRIFLUORODICHLORIDE AND FLUORINATION OF FLUORINATABLE HYDROCARBONS AND HALOCARBONS THEREWITH

John D. Weaver, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 11, 1982, Ser. No. 357,342

Int. Cl.³ C01B *7/24*

U.S. Cl. 423—466 **16 Claims**

1. A process for making antimony trifluorodichloride comprising dispersing antimony trifluoride in a liquid organic medium and contacting the dispersed antimony trifluoride with an amount of chlorine up to an amount equimolar to the antimony trifluoride, wherein the liquid reaction organic medium is selected from a group consisting of fluorinatable hydrocarbons, fluorinatable halocarbons and perfluorocarbons, under conditions such that antimony trifluorodichloride is prepared.

4,438,089

PROCESS FOR OXIDIZING THALLIUM (I) TO THALLIUM (III)

Lance R. Byers, East Windsor, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 6, 1982, Ser. No. 447,368

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—624 **14 Claims**

1. A method of oxidizing a thallous compound to a thallic compound consisting essentially of reacting the thallous compound with hydrogen peroxide in a solvent at a pH of less than 9.

4,438,090

METHOD OF PREPARING AN INSECTICIDE CONTAINING BORIC ACID

Alan D. Brite, 5147 W. Jefferson Blvd., Los Angeles, Calif. 90016

Continuation-in-part of Ser. No. 24,962, Mar. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 870,740, Jan. 19, 1978, abandoned. This application Apr. 29, 1982, Ser. No. 372,948

Int. Cl.³ G01N *31/00, 31/22, 33/48;* **A01N** *59/14*

U.S. Cl. 424—7.1 **7 Claims**

1. A method of preparing an insecticide containing an insecticidally effective amount of boric acid which comprises:

milling boric acid to a particle size between about 100 to about 400 mesh;

blending said boric acid particles with effective amounts of a member selected from the group consisting of magnesium stearate, silica gel, and tricalcium phosphate, and with a taste deterent effective amount of sucrose octa-acetate or denatonium benzoate, and with a non-white powdered pigment of sufficient quantity to color the insecticide sufficiently soon after said boric acid is milled so that said boric acid particles remain smaller than about 100 mesh; and

electrically charging said blend to induce an electrostatic charge on the discrete particles of the insecticide.

4,438,091

BROMHEXINE DELAYED-RELEASE PHARMACEUTICAL FORM

Peter Gruber, Biberach; Jochen Schmid, Warthausen; Horst Lechner, and Eckhart Bauer, both of Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,760

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126703

The portion of the term of this patent subsequent to Jan. 4, 1999, has been disclaimed.

Int. Cl.³ A61K *9/22, 9/24*

U.S. Cl. 424—21 **28 Claims**

1. A composition for the delayed release of bromhexine which comprises (i) spheroid particles or tablets comprised of (a) bromhexine and/or acid addition salts thereof and (b) at least one pharmacologically acceptable acid or acidic substance, the total amount of acid substance from acid addition salts present and the acid or acidic substance being in a ratio of at least 2 mols to 1 mol of bromhexine, and (ii) a coating surrounding said spheroid particles or tablets, said coating being comprised of from about 50 to 100 percent by weight of lacquers insoluble in gastric juices and soluble in intestinal juices and from about 0 to 50 percent by weight of lacquers insoluble in gastric and intestinal juices and said coating being present in an amount of from about 2 to 30 percent by weight, based upon the weight of the spheroid particles or tablets.

4,438,092

5-AMINO-N-(3-CHLORO- 2-METHYL-, OR 2-FLUOROPHENYL)-1,3-DIMETHYL-1H-PYRAZOLE-4-CARBOXAMIDES AND USE AS AN ANTI-CONVULSANT

Dietrich Schweiss, and Ivan C. Nordin, both of Holland, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 192,407, Sep. 30, 1980, Pat. No. 4,346,097. This application Jun. 14, 1982, Ser. No. 388,344

Int. Cl.³ A61K *31/415*; C07D *231/38*

U.S. Cl. 424—273 P **6 Claims**

1. 5-Amino-N-(3-chlorophenyl)-1,3-dimethyl-1H-pyrazole-4-carboxamide, and the pharmaceutically acceptable acid addition salts thereof.

4. A pharmaceutical composition useful for treating convulsions in a warm-blooded animals consisting essentially of an effective amount of 5-amino-N-(3-chlorophenyl)-1,3-dimethyl-1H-pyrazole-4-carboxamide, or the pharmaceutically acceptable acid addition salts thereof, in combination with a pharmaceutically acceptable carrier.

4,438,093

ORAL COMPOSITION CONTAINING DEXTRANASE AND α-1,3 GLUCANASE AND A METHOD FOR PREVENTING AND SUPPRESSING ORAL DISEASES USING THE SAME

Kazuo Shimada, Nakatado; Masataka Akiyama, Kanonji, and Masami Sudo, Mitoyo, all of Japan, assignors to The Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan

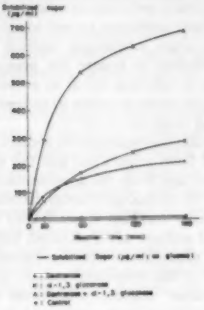
Filed Mar. 31, 1982, Ser. No. 364,182

Claims priority, application Japan, Apr. 3, 1981, 56-51004

Int. Cl.³ A61K *7/28, 37/48*

U.S. Cl. 424—50 **7 Claims**

1. An oral composition synergistic at pH 6.5 which comprises a pharmaceutically acceptable carrier, dextranase and α-1,3 glucanase, said dextranase and said α-1,3 glucanase both being present in an amount of 0.5 to 100 enzyme units per gram of said oral composition, said dextranase being present in an enzyme unit ratio of 1:2 to 2:1 relative to said α-1,3 glucanase, said dextranase being one prepared from dextranase-biosynthesizing microorganisms belonging to the genus Corynebacterium, said α-1,3 glucanase being one prepared from an α-1,3



glucanase-biosynthesizing microorganism belonging to the genus Pseudomonas.

4,438,094

COSMETIC FORMULATIONS CONTAINING OXYETHYLATED DIPHENYLAMINES AS SUN SCREEN AGENTS

Knut Oppenlaender, Ludwigshafen; Rainer Strickler, Heidelberg; Karl Seib, Weinheim, and Paul Naegele, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

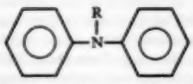
Filed Apr. 30, 1982, Ser. No. 373,417

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119385

Int. Cl.³ A61K *7/42, 7/035*

U.S. Cl. 424—59 **4 Claims**

1. A sunscreen composition comprising from 0.1 percent to 15 percent, based upon the total weight of the composition, of an N-oxyethylated diphenylamine sunscreen agent of the formula



wherein R is $(CH_2—CH_2—O)_n—H$ and n is an integer from 1 to 25, a cosmetic carrier selected from the group consisting of a solution, an oil, a cream, a salve, a lotion, a gel and a powder and auxiliary agents selected from the group consisting of thickeners, emulsifiers, preservatives and fragrances.

4,438,095

NEW COSMETIC COMPOSITIONS FOR HAIR OR SKIN CONDITIONING, AND THE APPLICATION THEREOF

Jean-Francois Grollier, Paris, and Josiane Allec, Pierrefitte, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Mar. 16, 1981, Ser. No. 244,313

Claims priority, application France, Mar. 18, 1980, 80 05985

Int. Cl.³ A45D *19/00*; A61K *7/06, 31/74, 47/00*

U.S. Cl. 424—70 **6 Claims**

1. A non-detergent, non-foaming cosmetic composition for conditioning the hair or skin consisting essentially of two separate liquid phases for admixture at the time of use, one of said liquid phases comprising an aqueous phase containing a soluble cationic polymer and the other of said phases comprising an oily phase, said aqueous phase being present in an amount ranging from 2–50 volume percent of said composition the balance being said oily phase, said soluble cationic polymer

being present in an amount ranging from 0.2 to 50 weight percent based on the total weight of said composition and said oily phase comprising 25 to 100 volume percent of a vegetable oil.

4,438,096

PEARLESCENT SHAMPOO

John C. Preston, Chicago, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed May 27, 1982, Ser. No. 382,421
Int. Cl.³ A61K 7/06
U.S. Cl. 424—70 17 Claims

1. In an improved pearlescent shampoo containing water and an effective amount of a cleansing, surface active agent wherein the improvement comprises myristyl myristate present in a crystalline state and in an amount of about 0.2 to about 2.5 weight percent as the pearlescing agent.

4,438,097

COCCIDIOSIS VACCINES

Martin W. Shirley, Huntingdon, England, assignor to National Research Development Corporation, London, England

Filed Sep. 8, 1981, Ser. No. 299,922
Claims priority, application United Kingdom, Sep. 5, 1980, 8028676
Int. Cl.³ A61K 39/012
U.S. Cl. 424—88 12 Claims

1. A process for the production of an attenuated strain of *E. necatrix*, which comprises:

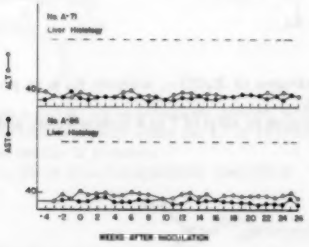
passaging a pathogenic *E. necatrix* in embryonated eggs for from about 20 to about 60 passages.

4,438,098

HEAT TREATMENT OF A NON-A, NON-B HEPATITIS AGENT TO PREPARE A VACCINE

Edward Tabor, Rockville, and Robert J. Gerety, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 343,026
Int. Cl.³ A61K 39/29
U.S. Cl. 424—89 2 Claims



1. A method of treating the agent of human non-A, non-B hepatitis to render it incapable of causing infection which consists essentially of heating said agent contained in serum or plasma at about 60° C. for about 10 hours and recovering said treated agent.

4,438,099

BURN TREATMENT

Vittorio Azzariti, Los Ficus 239-San Isidro, Lima 27, Peru

Filed Dec. 9, 1981, Ser. No. 328,815
Int. Cl.³ A61K 35/70
U.S. Cl. 424—93 3 Claims

1. A method for treating burn wounds comprising:

(a) applying to said burn wound a spray of a culture of *Candida Kruseii;*

(b) continuing application of said spray of *Candida Kruseii* to said burn wound until a crust forms covering said burn wound;

(c) allowing healing of said burn wound and regeneration of skin beneath said crust; and

(d) allowing said crust to spontaneously detach from said burn wound.

4,438,100

STERILIZED PRESERVED, STABLE MUCINE-CONTAINING SOLUTIONS

Erik Balslev, Fredensborg; Svenn S. Hansen, Virum, and Ernst L. Pedersen, Taastrup, all of Denmark, assignors to A/S Orthana Kemisk Fabrik, Kastrup, Denmark

PCT No. PCT/DK81/00043, § 371 Date Dec. 28, 1981, § 102(e) Date Dec. 28, 1981, PCT Pub. No. WO81/02977, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 27, 1981, Ser. No. 336,357
Claims priority, application Denmark, Apr. 25, 1980, 1811/80; Mar. 13, 1981, 1163/81
Int. Cl.³ A61K 35/38, 33/40
U.S. Cl. 424—104 29 Claims

1. An aqueous mucine-containing composition, in particular for application to human mucous membranes and/or for use as an ophthalmic solution, comprising a non-human mammalian mucine selected from the group consisting of buccal and gastrointestinal mucines, the composition having a viscosity of at the most 50 relative to water, as measured with an Oswald viscosimeter, said composition being sterilized and containing an oxidizing bactericide preservative which is present in a physiologically tolerable concentration with respect to the application of the composition.

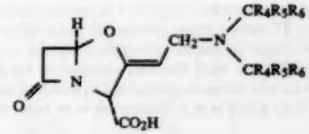
4,438,101

ANTIBIOTICS

Roger J. Ponsford, Dorking, and Thomas T. Howarth, Ewhurst, both of England, assignors to Beecham Group Limited, England

Division of Ser. No. 731,928, Oct. 13, 1978, abandoned. This application Sep. 22, 1978, Ser. No. 944,808
Int. Cl.³ A61K 35/00
U.S. Cl. 424—114 88 Claims

1. A pharmaceutical composition for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a compound of the formula:



or a pharmaceutically acceptable salt thereof wherein R_4 is hydrogen. R_5 is hydrogen or alkyl of 1 to 4 carbon atoms and R_6 is phenyl unsubstituted or substituted by a substituent selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and hydroxyl, and an antibacterially effective amount of amoxycillin or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4,438,091
BROMHEXINE DELAYED-RELEASE PHARMACEUTICAL FORM

Peter Gruber, Biberach; Jochen Schmid, Warthausen; Horst Lechner, and Eckhart Bauer, both of Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,760

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126703

The portion of the term of this patent subsequent to Jan. 4, 1999, has been disclaimed.

Int. Cl.³ A61K *9/22, 9/24*

U.S. Cl. 424—21 **28 Claims**

1. A composition for the delayed release of bromhexine which comprises (i) spheroid particles or tablets comprised of (a) bromhexine and/or acid addition salts thereof and (b) at least one pharmacologically acceptable acid or acidic substance, the total amount of acid substance from acid addition salts present and the acid or acidic substance being in a ratio of at least 2 mols to 1 mol of bromhexine, and (ii) a coating surrounding said spheroid particles or tablets, said coating being comprised of from about 50 to 100 percent by weight of lacquers insoluble in gastric juices and soluble in intestinal juices and from about 0 to 50 percent by weight of lacquers insoluble in gastric and intestinal juices and said coating being present in an amount of from about 2 to 30 percent by weight, based upon the weight of the spheroid particles or tablets.

4,438,092
5-AMINO-N-(3-CHLORO- 2-METHYL-, OR 2-FLUOROPHENYL)-1,3-DIMETHYL-1H-PYRAZOLE-4-CARBOXAMIDES AND USE AS AN ANTI-CONVULSANT

Dietrich Schweiss, and Ivan C. Nordin, both of Holland, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 192,407, Sep. 30, 1980, Pat. No. 4,346,097. This application Jun. 14, 1982, Ser. No. 388,344

Int. Cl.³ A61K *31/415*; C07D *231/38*

U.S. Cl. 424—273 P **6 Claims**

1. 5-Amino-N-(3-chlorophenyl)-1,3-dimethyl-1H-pyrazole-4-carboxamide, and the pharmaceutically acceptable acid addition salts thereof.

4. A pharmaceutical composition useful for treating convulsions in a warm-blooded animals consisting essentially of an effective amount of 5-amino-N-(3-chlorophenyl)-1,3-dimethyl-1H-pyrazole-4-carboxamide, or the pharmaceutically acceptable acid addition salts thereof, in combination with a pharmaceutically acceptable carrier.

4,438,093
ORAL COMPOSITION CONTAINING DEXTRANASE AND α-1,3 GLUCANASE AND A METHOD FOR PREVENTING AND SUPPRESSING ORAL DISEASES USING THE SAME

Kazuo Shimada, Nakatado; Masataka Akiyama, Kanonji, and Masami Sudo, Mitoyo, all of Japan, assignors to The Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan

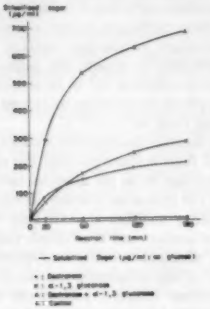
Filed Mar. 31, 1982, Ser. No. 364,182

Claims priority, application Japan, Apr. 3, 1981, 56-51004

Int. Cl.³ A61K *7/28, 37/48*

U.S. Cl. 424—50 **7 Claims**

1. An oral composition synergistic at pH 6.5 which comprises a pharmaceutically acceptable carrier, dextranase and α-1,3 glucanase, said dextranase and said α-1,3 glucanase both being present in an amount of 0.5 to 100 enzyme units per gram of said oral composition, said dextranase being present in an enzyme unit ratio of 1:2 to 2:1 relative to said α-1,3 glucanase, said dextranase being one prepared from dextranase-biosynthesizing microorganisms belonging to the genus Corynebacterium, said α-1,3 glucanase being one prepared from an α-1,3 glucanase-biosynthesizing microorganism belonging to the genus Pseudomonas.



4,438,094
COSMETIC FORMULATIONS CONTAINING OXYETHYLATED DIPHENYLAMINES AS SUN SCREEN AGENTS

Knut Oppenlaender, Ludwigshafen; Rainer Strickler, Heidelberg; Karl Seib, Weinheim, and Paul Naegele, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

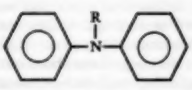
Filed Apr. 30, 1982, Ser. No. 373,417

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119385

Int. Cl.³ A61K *7/42, 7/035*

U.S. Cl. 424—59 **4 Claims**

1. A sunscreen composition comprising from 0.1 percent to 15 percent, based upon the total weight of the composition, of an N-oxyethylated diphenylamine sunscreen agent of the formula



wherein R is $(CH_2—CH_2—O)_n—H$ and n is an integer from 1 to 25, a cosmetic carrier selected from the group consisting of a solution, an oil, a cream, a salve, a lotion, a gel and a powder and auxiliary agents selected from the group consisting of thickeners, emulsifiers, preservatives and fragrances.

4,438,095
NEW COSMETIC COMPOSITIONS FOR HAIR OR SKIN CONDITIONING, AND THE APPLICATION THEREOF

Jean-Francois Grollier, Paris, and Josiane Allec, Pierrefitte, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Mar. 16, 1981, Ser. No. 244,313

Claims priority, application France, Mar. 18, 1980, 80 05985

Int. Cl.³ A45D *19/00*; A61K *7/06, 31/74, 47/00*

U.S. Cl. 424—70 **6 Claims**

1. A non-detergent, non-foaming cosmetic composition for conditioning the hair or skin consisting essentially of two separate liquid phases for admixture at the time of use, one of said liquid phases comprising an aqueous phase containing a soluble cationic polymer and the other of said phases comprising an oily phase, said aqueous phase being present in an amount ranging from 2–50 volume percent of said composition the balance being said oily phase, said soluble cationic polymer

being present in an amount ranging from 0.2 to 50 weight percent based on the total weight of said composition and said oily phase comprising 25 to 100 volume percent of a vegetable oil.

4,438,096
PEARLESCENT SHAMPOO

John C. Preston, Chicago, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed May 27, 1982, Ser. No. 382,421
Int. Cl.³ A61K *7/06*
U.S. Cl. 424—70 **17 Claims**

1. In an improved pearlescent shampoo containing water and an effective amount of a cleansing, surface active agent wherein the improvement comprises myristyl myristate present in a crystalline state and in an amount of about 0.2 to about 2.5 weight percent as the pearlescing agent.

4,438,097
COCCIDIOSIS VACCINES

Martin W. Shirley, Huntingdon, England, assignor to National Research Development Corporation, London, England

Filed Sep. 8, 1981, Ser. No. 299,922
Claims priority, application United Kingdom, Sep. 5, 1980, 8028676
Int. Cl.³ A61K *39/012*
U.S. Cl. 424—88 **12 Claims**

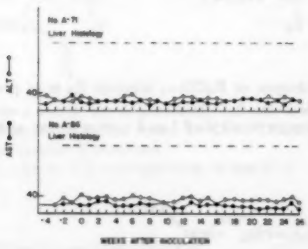
1. A process for the production of an attenuated strain of *E. necatrix*, which comprises:

passaging a pathogenic *E. necatrix* in embryonated eggs for from about 20 to about 60 passages.

4,438,098
HEAT TREATMENT OF A NON-A, NON-B HEPATITIS AGENT TO PREPARE A VACCINE

Edward Tabor, Rockville, and Robert J. Gerety, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 343,026
Int. Cl.³ A61K *39/29*
U.S. Cl. 424—89 **2 Claims**



1. A method of treating the agent of human non-A, non-B hepatitis to render it incapable of causing infection which consists essentially of heating said agent contained in serum or plasma at about 60° C. for about 10 hours and recovering said treated agent.

4,438,099
BURN TREATMENT

Vittorio Azzariti, Los Ficus 239-San Isidro, Lima 27, Peru

Filed Dec. 9, 1981, Ser. No. 328,815
Int. Cl.³ A61K *35/70*
U.S. Cl. 424—93 **3 Claims**

1. A method for treating burn wounds comprising:

(a) applying to said burn wound a spray of a culture of *Candida Kruseii;*

(b) continuing application of said spray of *Candida Kruseii* to said burn wound until a crust forms covering said burn wound;

(c) allowing healing of said burn wound and regeneration of skin beneath said crust; and

(d) allowing said crust to spontaneously detach from said burn wound.

4,438,100
STERILIZED PRESERVED, STABLE MUCINE-CONTAINING SOLUTIONS

Erik Balslev, Fredensborg; Svenn S. Hansen, Virum, and Ernst L. Pedersen, Taastrup, all of Denmark, assignors to A/S Orthana Kemisk Fabrik, Kastrup, Denmark

PCT No. PCT/DK81/00043, § 371 Date Dec. 28, 1981, § 102(e) Date Dec. 28, 1981, PCT Pub. No. WO81/02977, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 27, 1981, Ser. No. 336,357
Claims priority, application Denmark, Apr. 25, 1980, 1811/80; Mar. 13, 1981, 1163/81
Int. Cl.³ A61K *35/38, 33/40*
U.S. Cl. 424—104 **29 Claims**

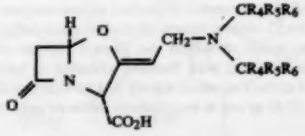
1. An aqueous mucine-containing composition, in particular for application to human mucous membranes and/or for use as an ophthalmic solution, comprising a non-human mammalian mucine selected from the group consisting of buccal and gastrointestinal mucines, the composition having a viscosity of at the most 50 relative to water, as measured with an Oswald viscosimeter, said composition being sterilized and containing an oxidizing bactericide preservative which is present in a physiologically tolerable concentration with respect to the application of the composition.

4,438,101
ANTIBIOTICS

Roger J. Ponsford, Dorking, and Thomas T. Howarth, Ewhurst, both of England, assignors to Beecham Group Limited, England

Division of Ser. No. 731,928, Oct. 13, 1978, abandoned. This application Sep. 22, 1978, Ser. No. 944,808
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—114 **88 Claims**

1. A pharmaceutical composition for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a compound of the formula:



or a pharmaceutically acceptable salt thereof wherein R_4 is hydrogen. R_5 is hydrogen or alkyl of 1 to 4 carbon atoms and R_6 is phenyl unsubstituted or substituted by a substituent selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and hydroxyl, and an antibacterially effective amount of amoxycillin or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4,438,102

METHOD OF PROMOTING TISSUE GROWTH

Salvatore Ganci, New York, N.Y., assignor to Ciro's Touch, Ltd., New York, N.Y.

Filed Aug. 10, 1982, Ser. No. 406,869
Int. Cl.³ A61K *31/19, 33/40*
U.S. Cl. 424—130 **14 Claims**

1. A method of promoting the growth of normal dermal and epidermal tissue in mammals which comprises topical treatment of a mammal in need of such promotion with a composition comprising from 25 to 40% by weight of a mixture containing thioglycolic acid and 65% to 85% dilute ammonium hydroxide at a pH of from 8.5 to 11 together with:

Glycerine: 0.15 to 0.25%
Citric Acid: 0.095 to 0.29%
Hydrogen Peroxide: 0.0097 to 0.014%
Solvent: 0.39 to 0.78%
Lower Alkanol: 0.78 to 1.95%
Gelatin: 1.17 to 2.73%

and water, all percentages pased on the total weight of the composition.

4,438,103

ORGANIC COMPOUNDS

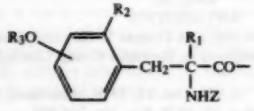
Wilfried Bauer, Magden; Francois Cardinaux; Rene Huguenin, both of Reinach; Janos Pless, Basel, and Edmond Sandrin, Riehen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 762,646, Jan. 26, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,617
Claims priority, application Switzerland, Feb. 2, 1976, 1266/76; Jun. 14, 1976, 7524/76; Jun. 14, 1976, 7525/76; Jul. 13, 1976, 8955/76; Jul. 13, 1976, 8956/76; Jul. 19, 1976, 9206/76; Jul. 19, 1976, 9208/76; Aug. 25, 1976, 10763/76; Aug. 25, 1976, 10764/76; Sep. 23, 1976, 12064/76
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **19 Claims**

1. A compound of the formula

A-B-Gly-D-E

wherein A is a residue of formula



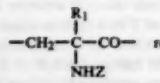
wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_2 is hydrogen or, together with R_1, forms an ethylene bridge, and

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms or an R_4CO— group, wherein

R_4 is a saturated or unsaturated branched or unbranched alkyl residue of 1 to 17 carbon atoms, phenyl or phenylalkyl of 7 to 12 carbon atoms in which the phenyl residue can be mono- or disubstituted with fluorine, chlorine or bromine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, whereby the R_3O group is in a position meta- or para- to the

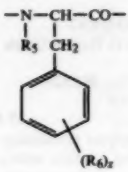


residue,

Z is hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 3 to 5 carbon atoms, cyclopropylmethyl, cyclobutylmethyl, R_4CO, wherein R_4 is as previously defined, H-Arg, H-Lys, H-Phe or H-Tyr,

B is -(D)Ala-,

D is a residue of formula



wherein

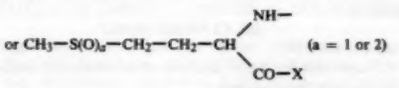
R_5 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_6 is hydrogen, fluorine, chlorine, bromine, nitro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and

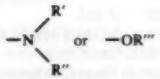
z is 1 or 2,

E is

(i) -Met-X, -Leu-X, -Nle-X, -Nva-X, -Ile-X, or

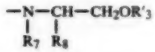


wherein X is



and each of R', R'', and R''' independently signifies hydrogen or alkyl of 1 to 5 carbon atoms, or

(ii) a residue of formula

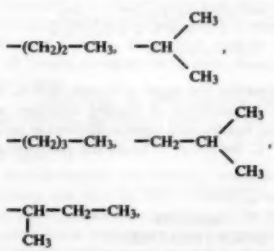


wherein

R_3' is hydrogen or R_4CO—, wherein R_4 is as previously defined,

R_7 is hydrogen or alkyl of 1 to 4 carbon atoms, and

R_8 is (a)



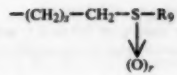
(b) $-(CH_2)_m-CH_2OR_3'$ wherein R_3' is as previously defined, and m is from 0 to 6,

(c)

wherein R_3' is as previously defined,

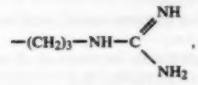
(d) $-CH_2-S-H$,

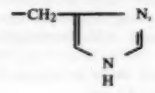
(e)

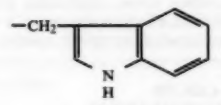


wherein R_9 is alkyl of 1 to 5 carbon atoms, r is 0, 1 or 2, and s is 0, 1 or 2,

(f) $-(CH_2)_4-NH_2$, $-(CH_2)_4-NHCOR_4$, wherein R_4 is as previously defined,



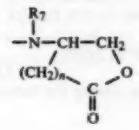




(g) $-(CH_2)_n-CONH_2$, wherein n is 1 or 2,

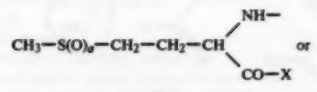
(h) $-(CH_2)_n-COOR_{10}$, wherein n is as previously defined, and R_{10} is hydrogen or alkyl of 1 to 5 carbon atoms, or

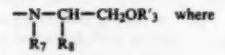
or (iii) a residue of formula



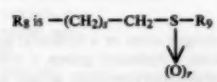
wherein n and R_7 are as previously defined, whereby the A and D residues possess either the L- or D,L-configuration and the residue E possesses

(1) the L-, D- or D,L-configuration, where E is





where



r is 1 or 2 and s, X, R_3', R_7 and R_9 are as previously defined or

(2) the D-configuration when E is other than as defined in 1 or a pharmaceutically acceptable salt or complex form thereof.

4,438,104

ENDORPHINS HAVING PLACENTAL OR PANCREATIC ORIGIN

Charles D. Kimball, and John C. Houck, both of Seattle, Wash., assignors to Endorphin, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 293,118, Aug. 17, 1981, abandoned, which is a continuation of Ser. No. 109,233, Jan. 3, 1980, Pat. No. 4,316,895. This application Jul. 1, 1982, Ser. No. 394,340

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ A61K *37/00*; **C07C** *103/52*

U.S. Cl. 424—177 **2 Claims**

1. An endorphin peptide having a molecular weight by amino acid analysis of about 14,000 daltons, having an infrared spectrum substantially as shown in FIG. 5, and having an amino acid analysis substantially as follows:

Amino Acid	Nanomoles
Aspartic acid	9.4
Threonine	6.2
Serine	10.1
Glutamic acid	16.0
Proline	6.3
Glycine	18.6
Alanine	12.5
Valine	6.0
Methionine	1.0
Isoleucine	2.6
Leucine	7.1
Tyrosine	1.1
Phenylalanine	4.3
Histidine	3.6
Lysine	7.8
Arginine	2.8
Total	115.4

said peptide being immunoreactive against beta-endorphin rabbit antisera and displacing Naloxone from opiate receptors in brain tissue.

4,438,105

4'-IODODERIVATIVES OF ANTHRACYCLINE GLYCOSIDES

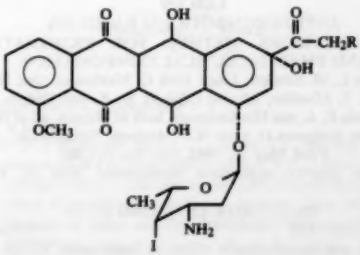
Antonino Suarato; Sergio Penco; Federico Arcamone, and Anna M. Casazza, all of Milan, Italy, assignors to Farmaitalia Carlo Erba S.p.A, Milan, Italy

Filed Apr. 14, 1982, Ser. No. 368,415

Int. Cl.³ A61K *31/71*; **C07H** *15/24*

U.S. Cl. 424—180 **5 Claims**

1. An anthracycline glycosidic compound of the general formula I.



I

wherein R is a hydrogen atom or a hydroxy group.

5. A method of inhibiting the growth of a tumor selected from the group of P388 leukemia or Gross leukemia, said method comprising administering to a host afflicted with said tumor a therapeutically effective amount of an anthracycline glycoside as claimed in claim 1.

4,438,106

INCLUSION COMPOUND OF EICOSAPENTAENOIC ACID OR DOCOSAHEXAENOIC ACID WITH CYCLODEXTRIN

Masakatsu Wagu; Shoichiro Hayashi, and Kouichi Kodama, all of Iwaki, Japan, assignors to Kureha Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,314

Claims priority, application Japan, Jul. 16, 1981, 56-111439

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **4 Claims**

1. An inclusion compound of cyclodextrin and one or more compounds selected from the group consisting of eicosapentaenoic acid, docosahexaenoic acid, alkali metal salts thereof, and C_1 to C_4 alkyl esters thereof.

4,438,107

AMINOGLYCOSIDES AND USE THEREOF

Isamu Watanabe, Higashimurayama; Takashi Yamaguchi, Tokyo; Kazuhiro Kamiya; Toshihito Mori, both of Higashimurayama; Hamao Umezawa; Sumio Umezawa, both of Tokyo, and Tsutomu Tsuchiya, Yokohama, all of Japan, assignors to Kowa Company, Ltd., Aichi and Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, both of, Japan

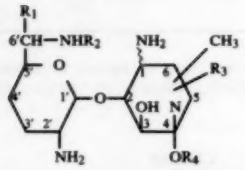
Filed Jul. 28, 1982, Ser. No. 402,812

Claims priority, application Japan, Jul. 29, 1981, 56-117856

Int. Cl.³ A61K *31/70*; C08B *37/00*

U.S. Cl. 424—180 **4 Claims**

1. A compound of the following formula



(I)

wherein one of R_1 and R_2 represents a hydrogen atom and the other, a methyl group, R_3 represents a hydrogen atom or an amino acyl group having 2 to 5 carbon atoms, R_4 represents a lower alkyl group substituted by one or two substituents selected from the class consisting of hydroxy and amino groups, or a hexopyranosyl group whose hydroxy groups may be substituted by amino groups,

or a pharmaceutically acceptable acid addition salt thereof.

4,438,108

ANTI-THROMBOTICUM BASED ON POLYSACHARIDES, METHOD FOR PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Adrianus L. M. Sanders, Uden; Dirk G. Meuleman, Oss; Hulbert C. T. Moelker, Megen; Gijsbert W. K. van Dëdem, and Francois E. A. van Houdenboven, both of Heesch, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed May 12, 1982, Ser. No. 377,581

Claims priority, application Netherlands, May 21, 1981, 8102514

Int. Cl.³ A61K *35/14*; C08B *37/10*

U.S. Cl. 424—183 **8 Claims**

3. An antithrombotically effective heparinoid, which is a mixture of oligo- and polysaccharides from residues of glucuronic acid, iduronic acid, glucosamine, galactosamine, and sulfated and acetylated derivatives thereof, said heparinoid having

(a) a molecular weight between 2000 and 40,000 daltons with a main peak between 2500 and 15,000 daltons;

(b) a specific rotation ($[\alpha]_D^{20}$) between $+25°$ and $+80°$;

(c) a nitrogen content between 1.5 and 4% by weight;

(d) a sulphur content between 5 and 7.5% by weight;

(e) a content of ionic groups in meq/g between 3 and 5;

(f) a content of sulphamido groups in meq/g between 0.5 and 1.5;

(g) a glucosamine content in meq/g of 0.5 to 1.5;

(h) a galactosamine content in meq/g of 0.0 to 0.1; and

(i) an idose (iduronic acid)/glucose (glucuronic acid)-ratio of 0.5 to 3;

said heparinoid having

(1) an anti-coagulation activity (USP) of less than 10 international units per mg;

(2) a negligible thrombin activity (less than 1% of that of heparin USP);

(3) an anti-X_a activity of less than 20% of that of heparin, usually between 2.5 and 15%;

(4) an anti-thrombotic activity (Umetsu model) with an ID_{50} of roughly 2 to 8 mg/kg i.v.;

(5) a bleeding activity which hardly increases at all over a wide dosage range (up to 300 mg/kg i.v.);

(6) a benefit/risk ratio which is 10–40 times more favourable than that for heparin USP having regard to the anti-thrombotic activity as compared with haemmorrhagic activity, and

(7) half value time which is at least twice as long as that of heparin USP.

6. Pharmaceutical composition having anticlotting activity which comprises an anticlotting effective amount of a compound of claim 3 in a pharmaceutical acceptable carrier.

4,438,109

TYLOSIN DERIVATIVES

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, and Akihiro Tanaka, both of Kanagawa, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

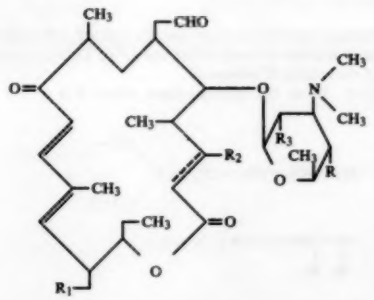
Filed Jul. 22, 1981, Ser. No. 285,747

Claims priority, application Japan, Jul. 25, 1980, 55-101933; Aug. 28, 1980, 55-118915; Nov. 6, 1980, 55-156263; Jan. 6, 1981, 56-573; Jan. 6, 1981, 56-574; Jan. 6, 1981, 56-575; Feb. 25, 1981, 56-26457; Jun. 19, 1981, 56-93782

Int. Cl.³ A61K *31/70*; C07H *17/08*

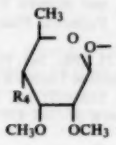
U.S. Cl. 424—180 **15 Claims**

1. A compound derived from tylosin having the formula



wherein R represents a hydrogen atom or a hydroxyl group; R_1 represents a halogen atom, a hydroxyl group, a tetrahydrofuranyloxy group, a tetrahydropyranyloxy group, a tetrahydrothiofuranyloxy group, a tetrahydrothiopyranyloxy group, an alkanoyloxy group, an arylcarbonyloxy group, an aralkylcarbonyloxy group, a lower alkylthiomethyloxy group,

a substituted or unsubstituted heterocyclic thio group, a mono- or di-lower alkylamino lower alkylthio group, or a group of the formula



wherein R_4 represents a hydroxyl group or an alkanoyloxy group; R_2 represents a hydrogen atom, a hydroxyl group, or an alkanoyloxy group; R_3 represents a hydroxyl group or an alkanoyloxy group; and ⋯ represents a single bond or a double bond but, when R_2 is a hydrogen atom, represents a double bond.

11. An antibiotic composition comprising a therapeutically effective amount of a tylosin derivative of claim **1** in combination with a pharmaceutically acceptable carrier.

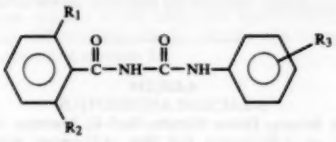
4,438,110

CHEWING INSECT TOXICANT COMPOSITIONS

Hafez M. Ayad, Cary, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

This application Apr. 28, 1982, Ser. No. 372,668
Continuation-in-part of Ser. No. 278,722, Jun. 29, 1981, now abandoned.
Int. Cl.³ A01N *57/02, 47/28*
U.S. Cl. 424—217 **37 Claims**

1. A chewing insect toxicant composition comprising a non-toxic carrier and an insecticidally effective amount of (1) a 1-(mono-substituted phenyl)-3-benzoyl urea compound having the formula:



in admixture with (2) a phosphorous-containing compound having the formula:

wherein:

R is:
an alkyl group having no more than ten carbon atoms, or aryl or aryl substituted with alkyl or alkoxy;

R_1 and R_2 are independently:
hydrogen, or halogen;

R_3 is:
halogen,
an alkyl, haloalky, alkoxy, or
haloalkoxy group having no more than
eight carbon atoms,
a pyridyloxy group, or
a halopyridyloxy group;

Y and Q are independently:
oxygen,or
sulfur; and

x is:
zero, or
one

wherein the weight proportion ratio of the 1-(mono-substituted phenyl)-3-benzoyl urea compound to the phosphorous containing compound is from about 1:5 to about 1:50,000 parts by weight respectively.

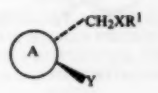
4,438,111

PROSTANOID COMPOUNDS AND PHARMACEUTICAL FORMULATIONS

Eric W. Collington, Welwyn; Peter Hallett, Buntingford, and Christopher J. Wallis, Royston, all of England, assignors to Glaxo Group Limited, London, England

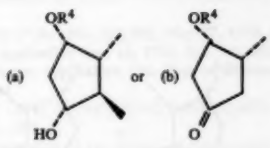
Continuation of Ser. No. 223,316, Jan. 8, 1981, abandoned. This application Sep. 17, 1982, Ser. No. 419,520
Claims priority, application United Kingdom, Jan. 9, 1980, 8000698
Int. Cl.³ A61K *31/535, 31/54;* **C07D** *413/12, 417/12*
U.S. Cl. 424—246 **8 Claims**

1. A compound of the formula



in which

A represents



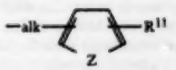
X is cis or trans —CH=CH— or $—(CH_2)_2—$;

R^1 is straight or branched C_{1-7} alkyl bearing as a terminal substituent —$COOR^{10}$ where R^{10} is a hydrogen atom, C_{1-6} alkyl or C_{7-10} aralkyl;

Y is a saturated heterocyclic amino group which has 5–8 ring members, and optionally contains in the ring one or more —O—, —S—, $—SO_2—$, $—NR^{14}$ —, or $C(OH)R^6$ substituents;

wherein R^{14} is a hydrogen atom, C_{1-7} alkyl or aralkyl having a C_{1-4} alkyl portion, R^6 is a hydrogen atom, C_{1-7} alkyl, phenyl or aralkyl having a C_{1-4} alkyl portion; and said saturated heterocyclic amino group is optionally substituted by one or more C_{1-4} alkyl groups;

R^4 is the group:



where alk is C_{1-3} alkylene;

Z is O, or S;

R^{11} is a hydrogen atom; C_{1-6} alkyl; C_{1-6} alkoxy; aryl or phenylalkoxy or phenylalkyl having a C_{1-3} alkyl portion, wherein the aryl portion is optionally substituted by C_{1-3} alkyl, C_{1-3} alkoxy or halogen; aryloxy; C_{5-7} cycloalkyl; halogen or nitro; and the physiologically acceptable salts thereof.

8. A composition comprising a compound as claimed in claim **1**, **2**, **3** or **7** with one or more pharmaceutical carriers.

4,438,112
PROSTANOID COMPOUNDS AND PHARMACEUTICAL FORMULATIONS

Eric W. Collington, Welwyn; Peter Hallett, Buntingford; Christopher J. Wallis, Royston, and John Bradshaw, Ware, all of England, assignors to Glaxo Group Limited, London, England

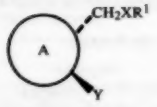
Continuation of Ser. No. 223,315, Jan. 8, 1981, abandoned. This application Sep. 17, 1982, Ser. No. 419,521

Claims priority, application United Kingdom, Jan. 9, 1980, 8000697

Int. Cl.³ A61K *31/53, 31/54;* C07D *295/14*

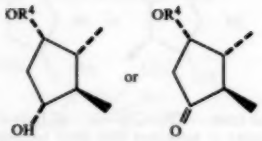
U.S. Cl. 424—244 8 Claims

1. A compound of the formula



in which

A represents



(a) (b)

X is cis or trans —CH=CH— or —$(CH_2)_2$—;

R^1 is straight or branched C_{1-7} alkyl bearing as a terminal substituent —$COOR^{10}$ where R is a hydrogen atom, C_{1-6} alkyl or C_{7-10} aralkyl;

Y is a saturated heterocyclic amino group which has 5–8 ring members, and optionally contains in the ring one or more —O—, —S—, —SO_2—, —NR^{14}—, or $C(OH)R^6$ substituents; wherein R^{14} is a hydrogen atom, C_{1-7} alkyl or aralkyl having a C_{1-4} alkyl portion, R^6 is a hydrogen atom, C_{1-7} alkyl, phenyl or aralkyl having a C_{1-4} alkyl portion; and said saturated heterocyclic amino group is optionally substituted by one or more C_{1-4} alkyl groups;

R^4 is a phenalkyl group having a C_{1-3} alkyl portion and a phenyl portion substituted with C_{1-3} alkylthio, C_{1-3} alkylsulphinyl, C_{1-3} alkylsulphonyl, C_{1-3} alkanoylamino, benzoylamino, phenylalkyl having a C_{1-3} alkyl portion, aminosulphonyl having the amino group optionally substituted by one or more C_{1-3} alkyl groups, C_{1-3} alkanoylaminosulphonyl having the amino group optionally substituted by C_{1-3} alkyl, phenylsulphony having the phenyl portion optionally substituted by C_{1-3} alkyl, nitro, tetrazol-5-yl, thienyl, or phenyl substituted by R^5 where R^5 is C_{1-4} alkyl, C_{1-4} alkoxy, halogen or phenyl;

and the physiologically acceptable salts thereof.

8. A composition comprising a compound as claimed in claim 1, 2, 3 or 7 with one or more pharmaceutical carriers.

4,438,113
7-ACYLAMINOCEPHALOSPORANIC ACID DERIVATIVES

Takao Takaya, Kawanishi; Hisashi Takasugi; Masayoshi Murata, both of Osaka, and Akiteru Yoshioka, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

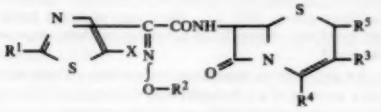
Filed Dec. 31, 1981, Ser. No. 336,161

Claims priority, application United Kingdom, Dec. 31, 1980, 8041635; Mar. 23, 1981, 8108991; Sep. 1, 1981, 8126500

Int. Cl.³ A61K *31/545;* C07D *501/56*

U.S. Cl. 424—246 17 Claims

1. 7-Acylaminocephalosporanic acid derivatives of the formula:



wherein

R^1 is amino or protected amino,

R^2 is carboxy(lower)alkenyl, protected carboxy(lower)alkenyl, lower alkenyl, cyclo(lower)alkenyl or lower alkynyl,

R^3 is a heterocyclicthiomethyl which may have substituents selected from the group consisting of lower alkyl and carboxy(lower)alkyl,

R^4 is carboxy or protected carboxy,

R^5 is hydrogen or lower alkyl, and

X is halogen,

and pharmaceutically acceptable salts thereof.

17. A pharmaceutical antimicrobial composition comprising an effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,438,114
β-LACTAM ANTIBIOTICS

Michael Boberg; Dieter Hübich; Karl G. Metzger, and Paul Naab, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

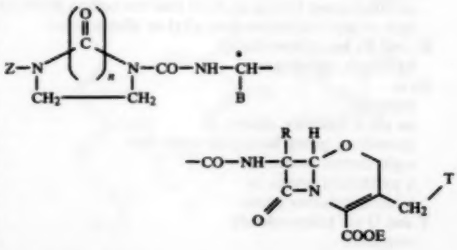
Filed Sep. 7, 1982, Ser. No. 415,632

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137038

Int. Cl.³ A61K *31/535;* C07D *498/04*

U.S. Cl. 424—248.51 12 Claims

1. A β-lactam of the formula



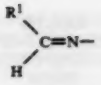
or a hydrate thereof,

in which

R represents a hydrogen atom or a methoxy group,

n is 1 or 2,

Z represents a group of the formula



wherein R^1 denotes a phenyl group which is optionally substituted by halogen, alkyl or alkoxy having 1 to 4 carbon atoms, nitro, cyano, 1 or 2 hydroxyl groups, S-alkyl having 1 to 4 carbon atoms, alkyl-sulphonyl having 1 to 4 carbon atoms or CH_3OOC—; or denotes a thienyl or furyl group which is optionally substituted by halogen, NO_2, alkyl or alkoxy-carbonyl having 1 to 4 carbon atoms, S—C_1 to C_4 alkyl, C_1 to C_4 alkylsulphonyl, C_1 to C_4-alkyl-sulphinyl or CH_3COOCH_2—, or denotes a pyridyl group;

or, when n is 1,

Z can also represent a cyclopropyl, furyl, pyridyl, thienyl, or benzthiazol-2-yl radical, or a 1, 3, 4-thiadiazol-2-yl radical which is optionally substituted in the 5-position by sec.-butyl, trifluoromethyl, methylthio, i-propylthio or methylsulphonyl,

B represents a phenyl, hydroxyphenyl, cyclohexadienyl, furyl, thienyl, pyrrolyl, imidazolyl, thiazolyl, isothiazolyl, isoxazolyl or thiadiazolyl group,

T denotes an alkyl—CO—O—, pyridinium, aminopyridinium, carbamoylpyridinium or carbamoyloxy group, an —S—phenyl group which can be substituted, or a tetrazolylthio or thia-diazolylthio group which is optionally substituted by alkyl having 1 to 4 carbon atoms, by CF_3 or by CH_2COOH; and

E represents a hydrogen atom, a pharmaceutically acceptable ester grouping, a salt-forming cation or a protective group, or represents a negative charge when T contains a quaternary nitrogen.

11. A method of combating bacterial illnesses in human and non-human animals which comprises administering to the animals an antibacterially effective amount of a compound or hydrate according to claim 1.

4,438,115

COMPOSITIONS AND METHODS FOR TREATING DISEASES IN CIRCULATORY ORGANS

Hiroyuki Nagano; Mitiro Takagi; Noboru Kubodera, all of Saitama; Isao Matsunaga, Tokyo; Tamotsu Yamazaki, Saitama; Hiroyuki Nabata, Tokyo; Kazushige Sakai, Tokyo, and Shun-ichi Hata, Kanagawa, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

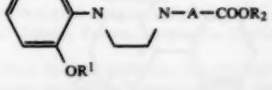
Filed Jun. 10, 1981, Ser. No. 272,077

Claims priority, application Japan, Jun. 13, 1980, 55-79043

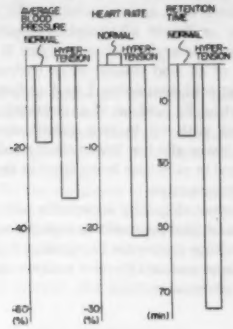
Int. Cl.³ A01N *43/48*

U.S. Cl. 424—250 **15 Claims**

1. A composition for treating diseases in circulatory organs which comprises a piperazine compound of the formula:



(wherein R_1 is a lower alkyl group; R_2 is a hydrogen atom or a lower alkyl; and A is a straight or branched alkylene) or a salt thereof and a pharmaceutically acceptable carrier selected from the group consisting of lactose, starch, mannitol, sucrose,



kaolin, crystalline cellulose, talc, calcium carbonate and magnesium stearate.

4,438,116

QUINOXALINYLOXY-AMINO-PROPANOL COMPOUNDS WITH BLOOD PRESSURE LOWERING AND β-BLOCKING PROPERTIES, THEIR USE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Carl H. Ross, Viernheim; Wolfgang Kampe, Heddesheim; Wolfgang Bartsch, Viernheim; Gisbert Sponer, Hemsbach, and Egon Roesch, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

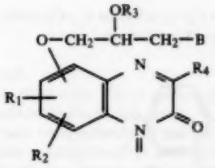
Continuation of Ser. No. 153,308, May 27, 1980, abandoned. This application Sep. 16, 1981, Ser. No. 302,894

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922084

Int. Cl.³ C07D *241/44, 241/42;* **A61K** *31/495, 31/505*

U.S. Cl. 424—250 **21 Claims**

1. An aminopropanol compound of the formula



wherein

R_1 and R_2 are individually selected from hydrogen and lower alkyl; or

R_1 and R_2 together represent an alkylene radical of between 2 and 4 carbon atoms;

R_3 is hydrogen or acyl in the form of an acid residue of an hydrocarbon aliphatic carboxylic acid containing 2 to 6 carbon atoms, an aromatic carboxylic acid or of an aromatic carboxylic acid substituted with up to two substituents selected from halogen, lower alkyl or lower alkoxy radicals;

R_4 is hydrogen or lower alkyl optionally including one substituent selected from hydroxyl, halogen or lower alkylthio; and

B is alkylamino which optionally carries on the alkyl moiety a phenyl and/or a phenoxy radical optionally substituted by one of halogen, hydroxyl, lower alkyl, lower acyl, lower alkylthio, acylamino, aminocarbonyl, lower alkoxy, lower alkenyloxy, phenoxy, lower alkenyl, lower alkylsulphonyl, lower alkylsulphinyl or haloalkyl; or

B is a phenyl-, naphthyl-, pyridyl-, pyrimidyl-, or benzimidazolinyl-oxymethylpiperidine radical, optionally

substituted by at least one of halogen, hydroxyl or lower alkyl, hydroxyl alkyl or carboxyamido alkyl, or by lower alkoxy, lower acyl, amino, carboxamido, lower alkanecarboxamido or lower alkylsulphonylamino; wherein the acyl radicals or acyl moieties in either B definition are in the form of an acid residue of an hydrocarbon aliphatic carboxylic acid containing 2 to 6 carbon atoms, an aromatic carboxylic acid or of an aromatic carboxylic acid substituted with up to two substituents selected from halogen, lower alkyl or lower alkoxy radicals, the piperidine radical in each case being fixed to the propanol chain by its nitrogen atom;

and the pharmacologically acceptable salts thereof.

2. A pharmaceutical composition with blood pressure lowering and β-blocking properties comprising a pharmaceutically acceptable carrier and, in effective amount, an aminopropanol compound as claimed in claim 1.

4,438,117

2-SUBSTITUTED THIO-4,5-DIARYLPYRIMIDINES

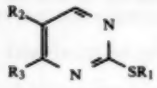
Saul C. Cherkofsky, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 3, 1980, Ser. No. 183,336

Int. Cl.³ A61K *31/505*; C07D *239/22*

U.S. Cl. 424—251 **18 Claims**

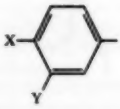
1. A compound of the formula



wherein

R_1=mono or polyfluoro C_1–C_2 alkyl or C_1–C_2 alkyl;

R_2 and R_3 independently=3-pyridyl or



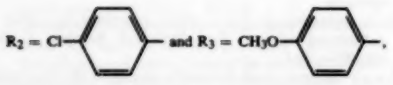
where X=H, F, Cl, OCH_3, OCH_2CH_3, $S(O)_nCH_3$, or di(C_1–C_2 alkyl)amino;

n=0, 1 or 2;

Y=H or Cl provided when Y=Cl,

X must=Cl;

provided R_2 and R_3 cannot both be phenyl; provided also that when



then R_1 cannot=CF_2CHF_2; or a pharmaceutical suitable salt thereof.

13. A method for treating arthritis or alleviating pain in a mammal which comprises administering to the mammal an effective antiarthritic or analgesic amount of a compound of claim 1.

4,438,118

SUBSTITUTED IMIDAZO[1,2-a]PYRIMIDINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim; Klaus Stockhaus, Bingen; Wolfram Gaida, Ingelheim, and Wolfgang Hoefke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

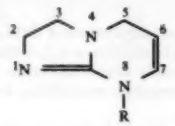
Filed Jun. 17, 1982, Ser. No. 389,284

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124718

Int. Cl.³ C07D *487/00*; A61K *31/505*

U.S. Cl. 424—251 **14 Claims**

1. A compound of the formula



wherein R represents a phenyl group having from 1 to 3 substituents selected from the group consisting of hydrogen, fluorine, chlorine and bromine atoms and methyl and trifluoromethyl groups, the substituents being identical or different, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,438,119

METHOD FOR ALLEVIATION OF EXTRAPYRAMIDAL MOTOR DISORDERS

Lloyd E. Allen, Evansville, and Leslie A. Riblet, Mt. Vernon, both of Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Dec. 23, 1982, Ser. No. 452,686

Int. Cl.³ A61K *31/505*

U.S. Cl. 424—251 **8 Claims**

1. A method for alleviation of extrapyramidal motor disorders which comprises administering a non-toxic therapeutically effective dose of buspirone or a pharmaceutically acceptable acid addition salt thereof to a mammal in need of such treatment.

4,438,120

PYRIDOINDOLOBENZODIAZEPINE TRANQUILIZERS

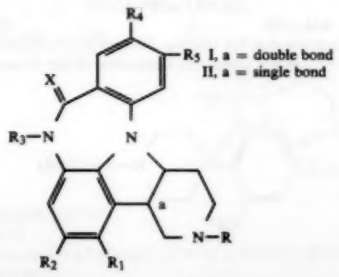
Parthasarathi Rajagopalan, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 12, 1982, Ser. No. 441,376

Int. Cl.³ A61K *31/55*; C07D *471/14*

U.S. Cl. 424—256 **14 Claims**

1. A compound of the formula:



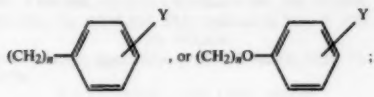
wherein

a is a single or double bond; provided that when a is a single bond, the ring fusion is of the trans-configuration;

R_1, R_2, R_4 and R_5 independently are H, alkyl of 1 or 2 carbon atoms, CF_3, Cl, F or Br;

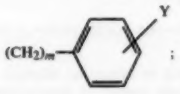
R_3 is H or alkyl of 1 to 3 carbon atoms;

R is H, alkyl of 1 to 10 carbon atoms, $(CH_2)_nC(O)R_6$, $(CH_2)_nCH(OH)R_6'$, $(CH_2)_nCONR_8R_9$, $(CH_2)_n(C_{3-7}$ cycloalkyl), $(CH_2)_n$adamantyl,

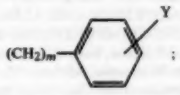


n is 1 to 8;

R_6 is H, OH, OR_7, C_{1-3} alkyl, C_{3-6} cycloalkyl, or



R_6' is H, C_{1-3} alkyl, C_{3-6} cycloalkyl,



m is O to 3;

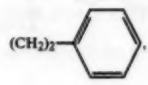
R_7 is CH_3 or C_2H_5;

Y is H, CH_3, OCH_3 or NO_2;

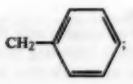
R_8 and R_9 are independently H, CH_3 or C_2H_5, or

R_8 and R_9, together, are $—CH_2CH_2OCH_2CH_2—$; and

X is H_2, O, or S, provided that when X is O or S, then a is a double bond; and provided further that when X is H_2, a is a single bond, and R_1, R_4 and R_5 are H, then R_2 cannot be CF_3 when R is CH_3 or



and R_2 cannot be Cl when R is



or a pharmaceutically acceptable salt thereof.

12. A method for tranquilizing a mammal which comprises administering to a mammal in need of such treatment a tranquilizing effective amount of a compound of claim 1, claim 2, claim 3, claim 4, claim 5, claim 6, claim 7, claim 8, claim 9 or claim 10.

4,438,121

ISOQUINOLINE AMIDOXIME DERIVATIVES

Daniel Obitz, Antony, France, assignor to Synthelabo, Paris, France

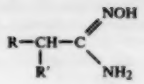
Filed May 25, 1982, Ser. No. 381,749

Claims priority, application France, May 26, 1981, 8110428

Int. Cl.³ A61K *310/47*; C07D *217/02*

U.S. Cl. 424—258 **6 Claims**

1. A heterocyclic amidoxime derivative of the formula:



wherein R′ represents hydrogen or methyl, and R represents 1-oxo-1H-isoquinolin-2-yl or 4-chloro-1-oxo-1H-isoquinolin-2-yl, and—when R′ represents methyl—racemates and enantiomers of such a compound, and pharmaceutically-acceptable acid addition salts thereof.

6. A method for the treatment of a patient suffering from a complaint of the central nervous system or for the treatment of depression which comprises administering to the patient an amount of a heterocyclic amidoxime derivative of the general formula depicted in claim 1, or a pharmaceutically-acceptable acid addition salt thereof, effective to ameliorate the condition of the patient.

4,438,122

COMBATING FUNGI WITH 1-PHENOXY-2-PYRIDINYL-ALKANOLS

Graham Holmwood, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

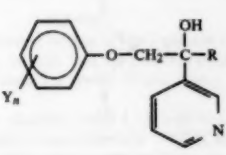
Division of Ser. No. 161,636, Jun. 20, 1980, which is a continuation of Ser. No. 937,650, Aug. 28, 1978, abandoned. This application Jun. 24, 1982, Ser. No. 391,749

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742173

Int. Cl.³ A61K *31/44*; C07D *213/30*

U.S. Cl. 424—263 **8 Claims**

1. A 1-phenoxy-2-pyridinylalkanol of the formula



in which

R is alkyl with 1 to 4 carbon atoms; or phenyl optionally substituted with halogen;

Y each independently is halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with up to 2 carbon atoms and up to 5 halogen atoms, alkoxy with up to 2 carbon atoms, phenyl, phenoxy or phenylalkoxy or phenylalkyl with 1 or 2 carbon atoms in the alkyl part; and

n is an integer from 0 to 2.

4,438,123

OPHTHALMIC COMPOSITIONS OF CARBONIC ANHYDRASE INHIBITORS FOR TOPICAL APPLICATION IN THE TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

Robert L. Smith, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 128,439, Mar. 4, 1980, abandoned. This application Dec. 22, 1981, Ser. No. 333,273

Int. Cl.³ A61K *31/425*

U.S. Cl. 424—270 **12 Claims**

1. An ophthalmic composition for lowering intraocular pressure comprising from 0.01 to 2% by weight of a mono alkali metal salt of a dibasic carbonic anhydrase inhibitor and an ophthalmologically acceptable carrier for topical application, where the carbonic anhydrase inhibitor is selected from the group consisting of N-[5-(amino-sulfonyl)-3-methyl-1,3,4-

thiadiazol-2(3H)-ylidene]-acetamide; N-[5-(amino-sulfonyl)-1,3,4-thiadiazol-2-yl]propanamide; N-[5-(aminosulfonyl)-1,3,4-thiadiazol-2-yl]butanamide and 5-benzenesulfonamido-1,3,4-thiadiazol-2-sulfonamide.

4,438,124

CYSTEINE DELIVERY SYSTEM

Alton Meister, New York, and Joanne M. Williamson, Roosevelt Island, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 233,564, Feb. 11, 1981, Pat. No. 4,335,210. This application Apr. 15, 1982, Ser. No. 368,905

Int. Cl.³ A61K *31/195*

U.S. Cl. 424—270 **1 Claim**

1. Method of combatting poisoning associated with the lessening of the glutathione content of cells of an in vivo system which comprises administering to the cells and amount of L-2-oxothiazolidine-4-carboxylate sufficient to increase the glutathione content of said cells.

4,438,125

ARYLAMINE DERIVATIVES AND USE AS MICROBICIDES

Adolf Hubele, Magden; Wolfgang Eckhardt, Lörrach, and Peter Riebli, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

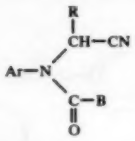
Division of Ser. No. 285,652, Jul. 21, 1981, Pat. No. 4,377,587. This application Sep. 13, 1982, Ser. No. 417,232

Claims priority, application Switzerland, Jul. 25, 1980, 5709/80; Jul. 25, 1980, 5710/80

Int. Cl.³ A01N *37/34*; C07C *121/78*

U.S. Cl. 424—269 **9 Claims**

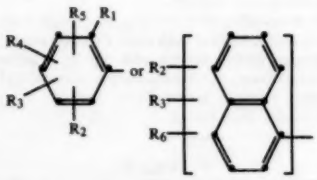
1. A compound of the formula



wherein

R is hydrogen or methyl,

Ar is one of the aromatic groups



wherein

R_1 is C_1–C_3alkyl, C_1–C_3alkoxy or halogen,

R_2 is NO_2 or NH_2,

R_3 is hydrogen, C_1–C_3alkyl, C_1–C_3alkoxy or halogen,

R_4 is hydrogen or C_1–C_3alkyl,

R_5 is hydrogen or C_1–C_3alkyl, and

R_6 is hydrogen, C_1–C_3alkyl or halogen;

B is C_3–C_4alkyl, C_2–C_4alkenyl, cyclopropyl, 2-furyl, 2-tetrahydrofuryl, β-(C_1–C_2alkoxy)ethyl or the group CH_2Z, in which

Z is 1H-1,2,4-triazolyl, methylsulfonyl, X—R_{13}, OSO_2—R_{14} or —$N(R_{15})(R_{16})$, in which

X is oxygen or sulfur,

R_{13} is an alkyl, alkenyl or alkynyl group, each containing at most 4 carbon atoms.

R_{14} is C_1–C_3alkyl or NH(C_1–C_3alkyl), and

R_{15} and R_{16}, each independently of the other, are C_1–C_3alkyl.

6. A method of controlling and/or protecting plants from attack by phytopathogenic microorganisms, which method comprises applying to said plants or to the locus thereof a microbicidally effective amount of a compound according to claim 1.

4,438,126

LOWER ALKANOIC ACID DERIVATIVES OF 2-OXO-BENZOXAZOLINES AND ALDOSE REDUCTASE INHIBITING COMPOSITIONS THEREOF

Ikuo Ueda; Masaaki Matsuo, both of Toyonaka; Susumu Satoh, Ikeda, and Takao Watanabe, Mukou, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

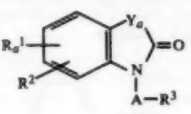
Division of Ser. No. 155,185, Jun. 2, 1980, Pat. No. 4,370,340. This application Aug. 18, 1982, Ser. No. 409,089

Claims priority, application Japan, Jun. 12, 1979, 54-74239

Int. Cl.³ C07D *263/58*; A61K *31/42*

U.S. Cl. 424—272 **3 Claims**

1. A compound of the formula:



wherein

R_a^1 is phenyl,

R^2 is halogen,

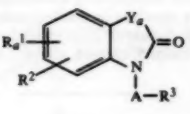
R^3 is carboxy or lower alkoxycarbonyl,

Y_a is oxygen,

A is C_1–C_6 alkylene,

and pharmaceutically acceptable salts thereof.

3. An aldose reductase inhibiting pharmaceutical composition which comprises, as an effective ingredient, at least one compound of the formula:



wherein

R_a^1 is phenyl,

R^2 is halogen,

R^3 is carboxy or lower alkoxycarbonyl,

Y_a is oxygen,

A is C_1–C_6 alkylene,

or pharmaceutically acceptable salts thereof with a pharmaceutically acceptable carrier.

4,438,127

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

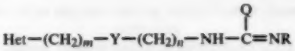
Division of Ser. No. 291,196, Aug. 10, 1981, Pat. No. 4,395,419, which is a division of Ser. No. 65,478, Aug. 10, 1979, Pat. No. 4,308,275, which is a division of Ser. No. 914,329, Jun. 12, 1978, Pat. No. 4,189,488, which is a division of Ser. No. 773,590, Mar. 2, 1977, Pat. No. 4,118,502. This application Mar. 7, 1983, Ser. No. 472,434

Claims priority, application United Kingdom, Mar. 11, 1976, 09750/76

Int. Cl.³ A61K *31/42;* C07D *263/34*

U.S. Cl. 424—272 8 Claims

1. A compound of the formula



wherein Het is an oxazole, isoxazole or triazole ring, which ring is optionally substituted by lower alkyl, halogen, lower alkoxy, hydroxy, trifluoromethyl, hydroxymethyl or amino; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; Y is sulphur, methylene or oxygen; R is hydrogen, lower alkyl or Het—$(CH_2)_m$—Y—$(CH_2)_n$— where Het, m, n and Y are as defined above; Q is —CO_2H or —SO_2H; or a pharmaceutically acceptable acid addition salt thereof.

8. A method of inhibiting gastric acid secretion which comprises administering internally to an animal a compound of claim 1.

4,438,128

CARDIOACTIVE ARYLOXYPROPANOLAMINES

Fritz Wiedemann, Weiheim-Lützelsachsen; Wolfgang Kampe, Heddesheim; Karl Dietmann, Mannheim, and Gisbert Sponer, Laudenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

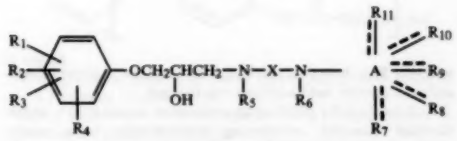
Filed Jun. 15, 1981, Ser. No. 273,543

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 3023369

Int. Cl.³ A61K *31/415;* C07D *231/54*

U.S. Cl. 424—273 N 5 Claims

1. An aryloxypropanolamine of the formula



wherein

R_1, R_2, R_3 and R_4 each independently is hydrogen, chlorine, bromine, fluorine, C_{1-4}-alkyl, cyano, carboxamido, hydroxyl, C_{2-5}-alkenyloxy or phenyl-C_{1-4}-alkoxy,

R_5 and R_6 each independently is hydrogen or C_{1-4}-alkyl,

X is an ethylene or propylene radical,

A is an indazole connected to the —X—N(R_6)— chain through a carbon atom,

R_7, R_8, R_9, R_{10} and R_{11} each independently is, or two of them together are, hydrogen, amino, C_{1-4}-alkyl or C_{2-5}-alkenyl;

or a pharmacologically compatible salt thereof.

3. A composition for combating cardiac and circulatory diseases comprising an amount effective therefor of a compound or salt according to claim 1 in admixture with a pharmacologically acceptable diluent.

4,438,129

USE OF CLOTRIMAZOLE TO TREAT HERPES LABIALIS

Isaac R. McGraw, Newtown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 27, 1982, Ser. No. 424,121

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R 2 Claims

1. A method of treating herpes I infections of the labial area in mammals comprising topically administering to the mammal in need of said treatment an effective amount for treating the herpes I virus of a composition of 1(o-chloro-α,α-diphenylbenzyl) imidazole or its salts and at least one pharmaceutically acceptable carrier, wherein the compound is from about 0.01 to about 95% by weight of the composition.

4,438,130

ANALGESIC 1-OXA-, AZA- AND THIA-SPIROCYCLIC COMPOUNDS

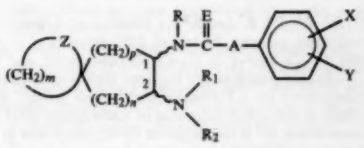
Lester J. Kaplan, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 320,635, Nov. 12, 1981, abandoned. This application Jun. 21, 1982, Ser. No. 390,462

Int. Cl.³ A61K *31/34, 31/35;* C07D *307/94, 311/96*

U.S. Cl. 424—274 26 Claims

1. A compound of the formula



(I)

wherein

p is a whole number integer 0, 1 or 2 and n is a whole number integer 1, 2, or 3, so that the resulting cycloaliphatic ring containing them has six (6) carbon atoms;

m is 3 or 4;

A is a single chemical bond (—), —$(CH_2)_q$ where q is a whole number integer 0 to 4 or —$CH(CH_3)$—;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, nitro, methoxy, hydroxy, azido, C_1 to C_3-alkyl, phenyl, methanesulfonyl, cyano, amino, C_1 to C_3-alkoxycarbonyl, C_1 to C_3-alkanoyloxy, C_1 to C_3-carboxyacylamino (—NHC(=O)R_4 where R_4 is hydrogen or C_1 to C_2-alkyl);

R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are each hydrogen, C_1 to C_3-alkyl or allyl;

R_1 and R_2, taken together with the nitrogen to which they are bonded complete a ring selected from the group consisting of azetidinyl, pyrrolidinyl and piperidinyl;

E is oxygen or sulfur;

Z is selected from the group consisting of oxygen, bivalent sulfur and sulfinyl;

provided that when p is 2, n is 1, m is 3, A is —$(CH_2)_q$ where q is 1, R is methyl, R_1 and R_2 are taken together with the nitrogen to which they are bonded to complete a pyrrolidinyl ring, E is oxygen, Z is oxygen, and the relative stereochemistry is (5α,7α,8β), then X and Y taken together on the phenyl ring cannot be chlorine on the 2- and 4-positions of the phenyl ring, or a pharmacologically acceptable salt thereof.

17. A composition useful in pharmaceutically effective dosage unit form for alleviating pain in warm blooded animals which comprises a compound of claim 1 in combination with a pharmaceutically acceptable carrier.

4,438,131
Ω-CYANO-1, Ω-DIPHENYL-AZAALKANE DERIVATIVES, THEIR PREPARATION AND DRUGS CONTAINING THEM

Oskar Ehrmann, Mannheim-Neuhermsheim; Manfred Raschack, Weisenheim am Sand; Josef Gries, Wachenheim; Rolf Kretzschmar, Gruenstadt; Hans D. Lehmann, Hirschberg; Ludwig Friedrich, Bruehl; Dirk Wuppermann, Freinsheim; Frank Zimmermann, Neustadt; Werner Seitz, Plankstadt; Hans J. Treiber, Bruehl; Ferdinand Dengel, Wilhelmsfeld; Wolfram Frank, Heidelberg; Hans-Georg Kurbjuweit, Weinheim-Hohensachsen, and Claus D. Mueller, Viernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

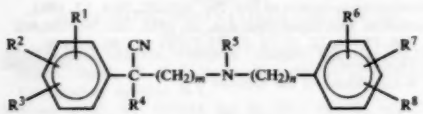
Filed Mar. 30, 1982, Ser. No. 363,501

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114497; Nov. 6, 1981, 3144150

Int. Cl.³ A61K *31/335, 31/275;* **C07C** *121/78*

U.S. Cl. 424—278 **15 Claims**

1. An ω-cyano-1,ω-diphenyl-azaalkane derivative of the formula I,



I

where R^1, R^2, R^3, R^6, R^7 and R^8 are identical or different and each is hydrogen, halogen, hydroxyl, trifluoromethyl, C_1–C_4-alkyl, nitro, C_1–C_4-alkoxy or C_1–C_4-alkylmercapto, and two radicals in adjacent positions can together form a methylenedioxy, ethylenedioxy or 1,3-dioxatetramethylene group, R^4 is straight-chain or branched, saturated or unsaturated alkyl of 9 to 20 carbon atoms, R^5 is hydrogen or C_1–C_4-alkyl and m and n are identical or different and each is from 2 to 4, and salts thereof with a physiologically tolerated acid.

15. The method of treating cardiovascular disorders in a patient suffering therefrom which comprises administering an effective amount of an ω-cyano-1,ω-diphenyl-azaalkane derivative of the formula I according to claim 1.

4,438,132
4-OXO-PGI$_2$ COMPOUNDS, THEIR USE IN INHIBITION OF THROMBII AND THEIR PRODUCTION

Gaza Galambos; Vilmos Simonidesz; Istvan Szekely; Jozsef Ivanics; Krisztina Kekesi; Gabor Kovacs; Istvan Stadler; Peter Körmoczy, and Karoly Horvath, all of Budapest, Hungary, assignors to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt., Hungary

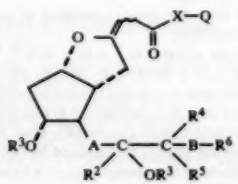
Filed Apr. 13, 1982, Ser. No. 368,013

Claims priority, application Hungary, Apr. 14, 1981, 2251/966

Int. Cl.³ A61K *31/557;* **C07D** *307/935*

U.S. Cl. 424—285 **39 Claims**

1. A compound of formula I



wherein

Q is a —COOR^1, —CH$_2$—OH, —CO—L^1 group,

R^1 is hydrogen, a pharmaceutically acceptable cation, C_{1-6} alkyl, C_{3-10} cycloalkyl, phenyl-C_{1-4}-alkyl which can be substituted on the phenyl moiety by phenyl, halogen, C_{1-4}-alkyl or halogen-substituted-C_{1-4} alkyl, or R^1 is phenyl or phenyl substituted by halogen, phenyl, C_{1-4} alkyl or halogen-substituted-C_{1-4} alkyl,

L^1 represents an amino group or an alkylamino or dialkylamino group containing C_{1-6} alkyl groups,

X is a —CH$_2$—CH$_2$—, —CH=CH—, —CH$_2$—C(CH$_3$)$_2$—, —(CH$_3$)$_2$C—CH$_2$— or a cyclopropylene group,

A is a trans- or cis—CH=CH—, —C≡C— or a —CH$_2$—CH$_2$— group,

R^2 represents hydrogen with α- or β-configuration, a methyl or ethyl group,

R^3 is hydrogen, C_{1-4} alkanoyl-, benzoyl or benzoyl whose phenyl group is substituted by halogen, phenyl, C_{1-4} alkyl or halogen-substituted-C_{1-4} alkyl, or tri-(C_{1-4})-alkyl-silyl group,

R^4, R^5 stand independently from each other for hydrogen or a C_{1-4} alkyl group,

B represents a methylene group, oxygen or a —NH-group and

R^6 is a C_{1-6} straight or branched alkyl group, phenyl or phenyl substituted by halogen, phenyl, C_{1-4} alkyl or halogen-substituted-C_{1-4} alkyl.

4,438,133
THERAPEUTICALLY EFFECTIVE DERIVATIVES OF CYSTINE

Dante Nardi; Alberto Tajana; Gianni Motta; Pietro Cazzulani, and Gabriele Graziani, all of Milan, Italy, assignors to Recordati S.A., Chiasso, Switzerland

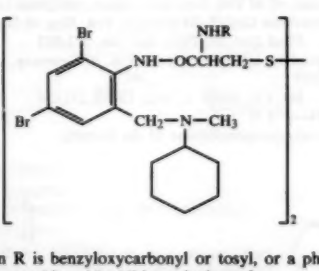
Filed Jun. 28, 1982, Ser. No. 392,806

Claims priority, application United Kingdom, Jul. 7, 1981, 8120907

Int. Cl.³ C07C *143/78, 125/073;* **A61K** *31/18, 31/27*

U.S. Cl. 424—300 **10 Claims**

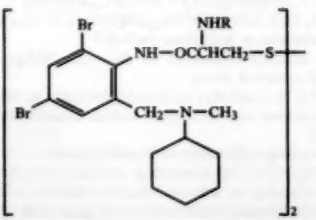
1. An amino/amide derivative of cystine having the structural formula (I):



(I)

wherein R is benzyloxycarbonyl or tosyl, or a pharmaceutically acceptable acid addition salt thereof.

5. A method for eliciting an antitussive response in a warm-blooded mammal, comprising administering to a warm-blooded mammal in need of such treatment, an antitussively effective amount of an amino/amide derivative of cystine having the structural formula (I):



(I)

wherein R is benzyloxycarbonyl or tosyl, or a pharmaceutically acceptable acid addition salt thereof.

4,438,134

USE OF TOLNAFTATE TO TREAT HERPES LABIALIS

Isaac R. McGraw, Newtown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 27, 1982, Ser. No. 424,119

Int. Cl.³ A61K *31/27*

U.S. Cl. 424—300 **2 Claims**

1. A method of treating herpes I infections of the labial area in mammals comprising topically administering to the mammal in need of said treatment an effective amount for treating the herpes I virus of a composition of O-2-naphthyl-m,N-dimethylthio carbanilate and at least one pharmaceutically acceptable carrier, wherein the compound is from about 0.01 to about 95% by weight of the composition.

4,438,135

1-(3,4-BIS-(3-(LOWER ALKOXYCARBONYL)-2-THIOUREIDO)-PHENYL-1-PHENYLTHYLENES

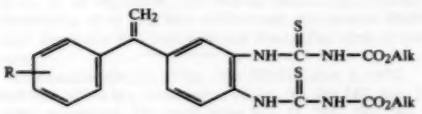
Alfred W. Chow, Radnor, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jan. 7, 1983, Ser. No. 456,199

Int. Cl.³ C07C *157/12*; A61K *31/325*

U.S. Cl. 424—300 **11 Claims**

1. A chemical compound of the formula:

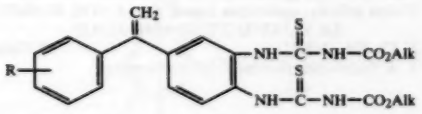


in which:

R is hydrogen, halo, C_{1-4}-lower alkoxy, C_{1-4}-lower alkyl or C_{1-4}-lower alkylthio, and

Alk is, each, C_{1-6}-lower alkyl.

4. An anthelmintic composition comprising an anthelmintic, nontoxic quantity of a compound of the formula:



in which:

R is hydrogen, halo, C_{1-4}-lower alkoxy, C_{1-4}-lower alkyl or C_{1-4}-lower alkylthio, and

Alk is C_{1-6}-lower alkyl, combined with a pharmaceutical or veterinary carrier therefor.

4,438,136

PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 219,307, Sep. 3, 1980, abandoned. This application Sep. 17, 1982, Ser. No. 419,206

Claims priority, application United Kingdom, Jan. 5, 1979, 7900369

Int. Cl.³ C07C *103/27*; A61K *31/24*

U.S. Cl. 424—309 **32 Claims**

1. A compound which is a bicyclo(2,2,1)heptane or hept-2Z-ene which is substituted at the 5-position by a group of the formula $—R^1—COQ$, where R^1 is selected from the group consisting of C_4–C_8 alkyl; $—CH_2—CH=CH—(CH_2)_m—$, wherein m is an integer from 1 to 5; $—CH_2—CH_2—CH=CH(CH_2)_n—$, where n is an integer from 0 to 4; $—X—(CH_2)_p—$, where p is an integer from 3 to 7; $—CH_2—X—(CH_2)_q—$, where q is an integer from 2 to 6; $—CH_2—CH_2—X—(CH_2)_m—$, and $—CH=CH—(CH_2)_3—$;

wherein X is —O— or —S—;

COQ is COOH, a physiologically acceptable carboxylate salt, a branched or unbranched C_1–C_5 alkyl ester or $CONHSO_2CH_3$;

and wherein said bicyclo(2,2,1)heptane or hept-2Z-ene is substituted at the 6-position by a grouping of the formula:

$$—C(R)=NNHCO—(NH)_a—R';$$

wherein R is selected from the group consisting of hydrogen, unsubstituted C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues, and C_1–C_{10} aliphatic hydrocarbon residues substituted by Ar, where Ar represents a monocyclic aromatic hydrocarbon or pyridyl residue, or such a residue substituted by one or more substituents selected from the group consisting of halogen, halogen substituted branched or unbranched C_1–C_5 alkyl groups, sulphonamido groups, amino groups, hydroxy and C_1–C_{10} alkoxy;

a is 0 or 1; and

R′ is selected from the group consisting of unsubstituted C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues, Ar and C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues substituted by —Ar, —OAr, or —SAr.

25. A method of treating thrombotic disorders, anaphylactic disease states and conditions requiring anti-inflammatory treatment in patients which comprises administering to the patient an amount of a compound according to claim 1 which is effective to inhibit thromboxane activity in the patient.

4,438,137

PESTICIDAL COMPOSITIONS EMPLOYING AMITRAZ WITH STABILIZER

Keith Allan, Loughborough, England, assignor to FBC Limited, Hauxton, England

Continuation-in-part of Ser. No. 179,588, Aug. 21, 1980, abandoned. This application Jun. 29, 1982, Ser. No. 393,277

Claims priority, application United Kingdom, Sep. 20, 1979, 7932636

Int. Cl.³ A01N *33/02*

U.S. Cl. 424—330 **6 Claims**

1. A liquid insecticidal and acaricidal composition comprising a solution of from about 0.5 to 35% w/v 1,5-di-(2,4-dimethylphenyl)-3-methyl-1,3,5-triazapenta-1,4-diene and from about 1 to 3% w/v of a carbodiimide selected from the group consisting of dicyclohexylcarbodiimide and di-(2,6-diisopropylphenyl) carbodiimide.

4,438,138

REDUCTION OF CHOLESTEROL WITH META-CHLORO α-T-BUTYLAMINOPROPIOPHENONE

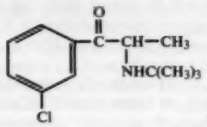
Warren C. Stern, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 6, 1982, Ser. No. 447,412

Int. Cl.³ A61K *31/135*

U.S. Cl. 424—330 **8 Claims**

1. A method of reducing cholesterol levels in a human in need thereof, which comprises administering to said human an effective, non-toxic, cholesterol-lowering amount of a compound of the formula (I)


(I)

or a pharmaceutically acceptable acid addition salt thereof.

4,438,139

POLYMERIC DIFFUSION MATRIX CONTAINING ESTROGENS

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 281,391, Jul. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 217,400, Dec. 17, 1980, Pat. No. 4,321,252, and Ser. No. 167,729, Jul. 11, 1980, Pat. No. 4,291,014, and Ser. No. 109,242, Jan. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned. This application Jan. 4, 1982, Ser. No. 439,023

The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.

Int. Cl.[3] **A61L** *15/03;* **A61K** *31/79, 31/74*

U.S. Cl. 424—28 **13 Claims**

1. A self-supporting polymeric diffusion matrix for the sustained release of a pharmacologically acceptable estrogen in order to deliver said estrogen to a patient and provide said patient with a uterine wall maintenance effect, said matrix comprising from about 1 to about 60% of a polar plasticizer, from about 6 to about 30% by weight polyvinylalcohol, from about 2 to about 30% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of the estrogen to provide a sustained release of said estrogen over a prolonged period.

4,438,140

SALTS OF ACID DYES AND COPOLYMERS HAVING TERTIARY AMINE FUNCTIONS, PROCESS FOR PREPARING SAID SALTS AND MAKEUP COSMETIC COMPOSITIONS CONTAINING THEM

Michel Guillon, Bourg-La-Reine; Jean Mondet, Sevran; Christos Papantoniou, Montmorency, and Claudine Vandenbossche, Aulnay-Sous-Bois, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

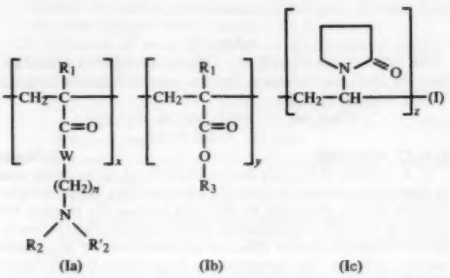
Filed Apr. 10, 1981, Ser. No. 252,809

Claims priority, application France, Apr. 18, 1980, 80 08742

Int. Cl.[3] **A61K** *7/04, 7/021*

U.S. Cl. 424—61 **16 Claims**

1. An acid colorant salt of an acid colorant salified by a copolymer having a tertiary amine function, said acid colorant being selected from the group consisting of Red 21 D and C, Orange 5 D and C, Red 27 D and C, Orange 10 D and C, Red 3 D and C, Acid Red 7 D and C, Red 2 D and C, Red 4 D and C, Acid Red 8 D and C, Acid Red 33 D and C, Acid Yellow 5 D and C, Acid Yellow 6 D and C, Acid Green 5 D and C, Acid Yellow 10 D and C, Acid Green 3 D and C, Blue 1 D and C, Blue 2 D and C and Violet 1 D and C, and said copolymer having the formula


(Ia) (Ib) (Ic)

wherein

n is 2 or 3,

W represents a bond, —O— or —NH—,

R_1 represents H or $—CH_3$,

R_2 and R_2' each independently represent lower alkyl having from 1 to 3 carbon atoms,

R_3 represents linear or branched alkyl having from 1 to 18 carbon atoms,

x represents from 5 to 95 weight percent,

y represents from 5 to 95 weight percent, and

z represents from 0 to 20 weight percent, with x+y+z being equal to 100 weight percent.

4,438,141

THIAZOLIDINE DERIVATIVES

Yutaka Kawamatsu, Kyoto, and Takeshi Fujita, Takarazuka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

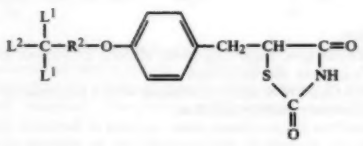
Division of Ser. No. 258,554, Apr. 29, 1981, Pat. No. 4,340,605, which is a division of Ser. No. 62,512, Jul. 27, 1979, Pat. No. 4,287,200. This application Jul. 7, 1982, Ser. No. 396,093

Claims priority, application Japan, Aug. 4, 1978, 53-95673

Int. Cl.[3] **C07D** *277/32;* **A61K** *31/425*

U.S. Cl. 424—248.51 **10 Claims**

1. A thiazolidine derivative of the formula:



wherein R^1 is thienyl, furyl or a group of the formula:

where R^3 and R^4 are the same or different and each is lower alkyl or R^3 and R^4 are combined with each other either directly or as interrupted by an oxygen atom to form piperidono, morpholino or pyrrolidino; R^2 means a bond or a lower alkylene group; L^1 and L^2 are the same or different and each is hydrogen, lower alkyl or L^1 and L^2 are combined to form an alkylene group.

4,438,142
PHARMACEUTICAL COMBINATION

Ralph Vinegar, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 354,160, Mar. 5, 1982. This application Sep. 16, 1982, Ser. No. 418,979

Int. Cl.³ A61U *31/485*

U.S. Cl. 424—260 8 Claims

1. An analgesic preparation comprising codeine or a pharmaceutically acceptable salt thereof and 1-(1-3-benzodioxol-5-yl)-2-pyrrolidinone wherein the ratio of codeine or a pharmaceutically acceptable salt thereof to the compound of formula I 1-(1-3-benzodioxal-5-yl)-2-pyrodidinone is in the range of 1:10 to 1:50.

4,438,143
1-ARYLOXY-3-ALKYLAMINO-2-PROPANOLS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Herbert Köppe; Werner Kummer; Helmut Stähle; Gojko Muacevic, all of Ingelheim, and Werner Traunecker, Münster-Sarmsheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

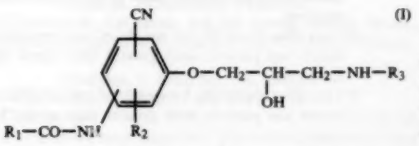
Continuation-in-part of Ser. No. 383,624, Jun. 1, 1982, abandoned, which is a continuation of Ser. No. 254,510, Apr. 15, 1981, abandoned. This application Sep. 21, 1982, Ser. No. 420,796

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015991

Int. Cl.³ A61K *31/275*; C07C *121/80*

U.S. Cl. 424—304 9 Claims

1. A compound of the formula



wherein

R_1 represents a linear or branched alkyl of from 1 to 20 carbon atoms;

R_2 represents a hydrogen or halogen atom, a linear or branched alkyl or alkoxy of from 1 to 4 carbon atoms, or a divalent group —CH=CH—CH=CH— or —$(CH_2)_n$—, in which n is an integer of from 3 to 5, with the free valences bonded in the o-position relative to one another; and

R_3 represents a linear or branched alkyl of from 3 to 10 carbon atoms, with the provisos that R_3 is not tert.butyl when R_1 is ethyl or propyl and R_2 is a hydrogen atom and that R_3 is not isopropyl when R_1 is propyl and R_2 is hydrogen,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

8. A method for the treatment or prophylaxis of diseases of the coronaries, for the treatment of hypertension, or for the treatment of cardiac arrhythmia, which comprise administering to a warm-blooded animal or human an effective amount of a compound of claim 1.

4,438,144
AMINO ACID PREPARATION AND THERAPY FOR TREATMENT OF STRESS AND INJURY

George L. Blackburn, 100 Memorial Dr., Cambridge, Mass. 02142

Continuation of Ser. No. 174,189, Jul. 31, 1980, abandoned. This application Apr. 29, 1982, Ser. No. 373,125

Int. Cl.³ A61K *31/195*

U.S. Cl. 424—319 5 Claims

1. A method of nutritional therapy for a patient suffering from physical injury or metabolic stress, said patient having a normalized urinary nitrogen excretion of at least about 15 gr/dayand having at the same time at least a partial dysfunction of the gastrointestinal tract in order to at least partially sustain protein synthesis in said patient comprising parenterally administering to said patient an effective nutritional therapy amount of an amino acid parenteral composition in which 70 to 100% of the amino acid content consists of the branched chain amino acids, leucine, isoleucine and valine in relative proportions a:b:c wherein a, b and c are independent of each other and have a value from 1 to 2 to provide effective nutritional therapy for said patient.

4,438,145
PROCESS FOR THE PREPARATION OF A FOOD-STUFF CONSISTING OF A STUFFING ROLLED IN A WRAP

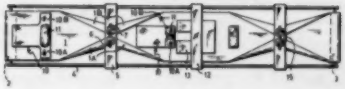
Arie Bakker, Gouda, Netherlands, assignor to Bamach, B. V., Lekkerkerk, Netherlands

Continuation of Ser. No. 245,196, Mar. 18, 1981, abandoned, which is a continuation of Ser. No. 40,766, May 21, 1979, abandoned. This application Dec. 15, 1982, Ser. No. 450,111

Claims priority, application Netherlands, May 26, 1978, 7805735

Int. Cl.³ A23L *1/31*

U.S. Cl. 426—297 1 Claim



1. The method of wrapping an elongate edible stuffing of generally circular cross section with a T-shaped edible wrap embodying an elongated rectangular crossbar and a rectangular stem extending continually and symmetrically therefrom, said stem having a width dimension parallel to the length of the crossbar, with the length of the elongated stuffing approximately equalling the width dimension of the stem and with the diameter of the circular cross section of the edible stuffing approximately equalling the width of the elongated rectangular crossbar, said method comprising depositing the T-shaped wrap on a continuously-moving, normally flat, flexible conveyor belt of a width exceeding the length of the crossbar of the T-shaped wrap with the crossbar centered transversely of the conveyor belt and leading the stem with respect to the direction of movement of the conveyor belt; at an intermediate point along the travel of the conveyor belt beyond the place of deposit of the wrap on the conveyor belt, depositing the stuffing on the crossbar of the wrap with its longitudinal axis coinciding with the longitudinal axis of the crossbar and centered thereon with respect to its ends and sides; at an intermediate point along the travel of the conveyor belt beyond the place of deposit of the stuffing on the wrap, with the aid of transversely-spaced guides, stationary with respect to the direction of movement of the conveyor belt, having transversely-spaced, opposed concave side surfaces situated at a spacing corresponding to substantially the length of the stuffing and horizontal surfaces parallel to the conveyor belt spaced therefrom by a distance corresponding substantially to the diameter of the stuffing, folding the marginal portions of the conveyor belt

upwardly about the opposite ends of the stuffing and inwardly against the top of the stuffing to thus fold the end portions of the crossbar of the wrap upwardly about the ends of the stuffing and inwardly into engagement with the top of the stuffing; at an intermediate point in the travel of the conveyor belt beyond the place of folding the conveyor belt upwardly and inwardly, allowing the conveyor belt to return to its normally flat position, leaving the end portions of the crossbar of the wrapper folded upwardly about the ends of the stuffing in engagement with the top of the stuffing; and at an intermediate point in the travel of the conveyor belt following return of the conveyor belt to its flat position, with the aid of means positioned above the conveyor belt stationary with respect to the movement of the conveyor belt, frictionally engaging the end portions of the crossbar of the wrap in engagement with the top of the stuffing to constrain the top of the partially wrapped stuffing relative to the movement of the conveyor belt such that movement of the lower part of the partially wrapped stuffing with the conveyor belt rolls the stuffing and crossbar of the wrap about the longitudinal axis of the stuffing relative to the stem of the wrap to thus coil the stem of the wrap about the stuffing and the end portions of the crossbar and wrap.

4,438,146

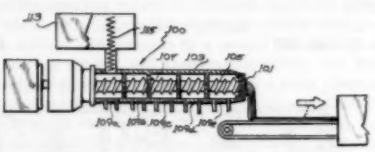
METHOD FOR PREPARING COOKED WHEAT PRODUCT

Ronald W. Colby, Peru, Ill., and Arnold Spicer, Santa Ponsa, Spain, assignors to New Generation Foods, Inc., Reno, Nev.

Filed Mar. 16, 1982, Ser. No. 358,789

Int. Cl.³ A23L *1/18*; A21D *8/00*

U.S. Cl. 426—448 **13 Claims**



1. A method for preparing an expanded wheat product comprising the steps of grinding whole wheat, adding moisture to the ground wheat, uniformly distributing the moisture in the ground wheat to make a dough, conducting the dough to a die, heating the dough by passing it through the die at a rate sufficient to generate heat and steam in the dough without any external heat source to the die and cook the dough in the die to condition the wheat and extruding the dough into a lower pressure zone to flash steam and expand the dough.

4,438,147

FOAMING CREAMER AND METHOD OF MAKING SAME

Paul L. Hedrick, Jr., Plain City, Ohio, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jun. 25, 1982, Ser. No. 392,229

Int. Cl.³ A23C *1/04*; A23G *1/00*; A23L *2/00, 2/40*

U.S. Cl. 426—570 **30 Claims**

1. A method of making a foaming creamer comprising:

(a) forming a liquid mixture comprising water and solids, said mixture being devoid of an effective amount of surface tension reducing agents, said solids including at least about 5% non-dairy fat, at least about 30% water-soluble non-dairy carbohydrate, and between 0% and about 50% dry skim milk, there being present in said solids an effective amount of a proteinaceous foam stabilizer;

(b) blending an inert gas to gassify said mixture;

(c) homogenizing said mixture; and

(d) spray-drying said mixture, after said gas-blending and homogenizing steps, by:

(1) forcing the mixture through an orifice under a spray pressure sufficient to finely atomize the mixture, and

(2) contacting the atomized mixture with a gaseous drying medium at an elevated temperature, to thereby produce a substantially dry powder devoid of an effective amount of surface tension reducing agents.

4,438,148

PROCESS FOR MAKING AN IMPROVED DRY INSTANT PUDDING MIX

Joseph D. O'Rourke, Cranbury, N.J., and Jay H. Katcher, Dover, Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,685

Int. Cl.³ A23L *1/187, 1/195*

U.S. Cl. 426—579 **7 Claims**

1. A process for making an instant pudding mix comprising the following steps in the stated order:

(a) pregelatinizing and drying a starch in a manner effective to produce a pregelatinized starch particle size distribution wherein at least 40% by weight of the starch has a particle size of about 63 microns or greater;

(b) grinding and controlling said dry, pregelatinized starch in a manner effective to produce a ground starch particle size distribution wherein:

(i) between at least 1% and up to 10%, by weight, of said pregelatinized starch has a particle size greater than about 63 microns, but

(A) less than about 1%, by weight, of said pregelatinized starch has particle sizes greater than about 105 microns,

(B) less than about 3%, by weight of said pregelatinized starch has particle sizes greater than about 88 microns, and

(C) less than about 6%, by weight of said pregelatinized starch has particle sizes greater than about 74 microns,

(ii) between about 55% and about 80%, by weight, of said starch has particle sizes less than about 38 microns, and at least 10%, by weight of said starch, has particle sizes less than about 20 microns;

(c) apportioning a quantity of said ground, pregelatinized starch in a manner effective to constitute between about 5% and about 25%, by weight of the pudding mix;

(d) combining said apportioned starch with sugar, setting, and flavoring components wherein:

(i) said sugar component is between about 25% and about 85% by weight of the pudding mix,

(A) between 15% and about 40% of said sugar component is powdered sugar, and

(B) at least about 90% of the sugar component has particle sizes less than 74 microns; and

(ii) said setting component is between about 1% and about 5%, by weight of the pudding mix and said setting component consists essentially of an alkali pyrophosphate and an alkali orthaphosphate;

(e) blending said combined components; and

(f) packaging said blended, combined components.

4,438,149
SPREADABLE WATER-IN-OIL EMULSION BASED ON A HIGH-MELTING BUTTERFAT FRACTION AND A LIQUID OIL

Laurentius A. M. Verhagen, Vlaardingen, and Janos Bodor, Voorburg, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,715
Claims priority, application Netherlands, Apr. 2, 1981, 8101639
Int. Cl.³ A23D 3/00, 3/02
U.S. Cl. 426—603 17 Claims

1. An edible spreadable water-in-oil emulsion comprising:

(i) an aqueous phase having a pH of from 4.0 to 7.0 and constituting at most 70 percent by weight of the total emulsion;

(ii) a fatty phase containing

(a) a liquid oil which at 10° C. is substantially free of solid fat crystals and

(b) a butter stearin fraction having the following solid fat contents:

N_{10}=50–80; N_{20}=25–45; N_{35}=3–18

wherein the ratios between the components of the fatty phase are such as to impart to the fatty phase the following solid fat contents:

N_{10}=15–40; N_{20}=8–20; N_{35}=0–5.

4,438,150
PROCESS FOR PREPARING AN INSTANT BABY CEREAL PORRIDGE PRODUCT

Scott Gantwerker, LaGrange, and Sai Leong, Buffalo Grove, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Sep. 9, 1982, Ser. No. 416,190
Int. Cl.³ A23L 1/10; A21D 8/06
U.S. Cl. 426—625 7 Claims

1. A process for preparing a dry, gelatinized, cereal porridge product capable of being instantly prepared as a hot or cold cereal porridge comprising:

a. preparing a slurry of cereal flour having a Mesh size less than U.S. Mesh size #40, and water in which the flour is present in an amount of from 14 to 30% inclusive based on the weight of the slurry;

b. gelatinizing the cereal flour slurry by heating until such time as the gelatinized cereal flour-water mixture has achieved a temperature in the range 180°–212° F. and the viscosity of the gelatinized cereal mixture is greater than 20,000 cps as measured on a RVT Brookfield viscometer at 50 rpm using spindle #7;

c. subjecting the gelatinized cereal mixture to mechanical shear of sufficient intensity and duration to reduce the viscosity of said gelatinized cereal mixture to a viscosity less than 10,000 cps as measured on a RVT Brookfield viscometer at 50 rpm using spindle #5 yielding a reduced viscosity gelatinized cereal mixture; and

d. dehydrating on a drum drier the reduced viscosity cereal mixture to a moisture in the range 2.0 to 9.0% inclusive, and pulverizing the dehydrated material thereby forming the dry gelatinized cereal product.

4,438,151
PROCESS FOR DURABLY MODIFYING A SHAPED SYNTHETIC POLYMER ARTICLE

Taturo Yamaguchi, Ikeda, and Norihiro Minemura, Takatsuki, both of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 158,731, Jun. 12, 1980. This application Feb. 16, 1983, Ser. No. 466,864
Claims priority, application Japan, Jun. 26, 1979, 54-79613
Int. Cl.³ B05D 3/06
U.S. Cl. 427—36 15 Claims

1. A process for durably modifying a shaped synthetic polymer article, comprising the steps of:

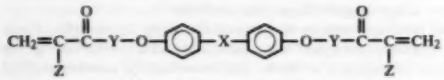
(a) applying, onto at least a peripheral surface portion of a shaped synthetic polymer article:

(1) 0.1 percent to 40 percent, based on the weight of said shaped article, of a compound (A) selected from the group consisting of styrene, vinyltoluene, allyl cinnamate, allyl phenol, allyl phenylether, allyl glycidylether, sodium p-styrene-sulfonate, diallyl terephthalate, diallyl isophthalate, N,N'-diallyl pyromellitimide, N,N'-dimethallyl pyromellitimide, N,N'-dicrotyl pyromellitimide, N,N'-diallylbenzophenone-3,4,3',4'-tetracarboxylic acid bis-imide, N,N'-dimethylallylbenzophenone-3,4,3',4'-tetracarboxylic acid bis-imide, N,N'-dicrotylbenzophenone-3,4,3',4'-tetracarboxylic acid bis-imide, N,N'-diallylbutane-1,2,-3,4-tetracarboxylic acid bis-imide, N,N'-dimethylallylbutane-1,2,3,4-tetracarboxylic acid bis-imide, N,N'-dicrotylbutane-1,2,3,4-tetracarboxylic acid bis-imide, N,N'-diallylbenzamide, N,N'-dimethallylbenzamide, N,N'-dicrotylbenzamide, N,N'-diallylterephthalamide, N,N'-dimethallylterephthalamide, N,N'-dicrotylterephthalamide, N,N'-diallylisophthalamide, N,N'-dimethallylisophthalamide, N,N'-dicrotylisophthalamide, N,N'-diallyladipamide, N,N'-dimethallyladipamide, N,N'-dicrotyladipamide, N,N,N',N'-tetraallylisophthalamide, N,N,N',N'-tetramethallylisophthalamide, N,N,N',N'-tetracrotylisophthalamide, N,N',N''-triallyltrimesic acid amide, N,N',N''-trimethallyltrimesic acid amide, N,N'',N''-tricrotyltrimesic acid amide, N,N,N',N',N'',N''-hexallyltrimesic acid amide, N,N,N',N'',N'',-hexamethallyltrimesic acid amide, N,N,N',N',N'',N''-hexacrotyltrimesic acid amide, N,N'-diallyltrimellitamideimide, N,N'-dimethallyltrimellitamideimide, N,N'-dicrotyltrimellitamideimide, N,N,N'-triallyltrimellitamideimide, N,N,N'-trimethallyltrimellitamideimide, N,N,N'-tricrotyltrimellitamideimide, ethylene-bis(N-allyltrimellitic acid imide), hexamethylene-bis(N-allyltrimellitic acid imide)amide, dodecamethylene-bis(N-methallyltrimellitic acid imide)amide, the compounds of the formula:

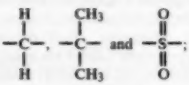
wherein A represents a member selected from allyl, methallyl and crotyl radicals, triallyl isocyanurate trimethallyl isocyanurate, tricrotyl isocyanurate, tetrallyl urea, tetramethallyl urea, tetracrotyl urea, ethyleneglycol bis-allyl-ether, ethyleneglycol bis-methallylether, ethyleneglycol bis-crotylether, tetramethylene glycol bis-allylether, tetramethyleneglycol bis-methallylether, tetramethyleneglycol bis-crotylether, neopentyleneglycol bis-allylether, neopentyleneglycol bis-methallylether, neopentyleneglycol bis-crotylether, triallyloxypropane, trimethallyloxypropane, tricrotyloxypropane, tetrakisallyloxymethlymethane, tetrakismethallyloxymethylmethane, tetrakiscrotyloxymethylmethane, triallyl cyanurate, trimethallyl cyanurate and tricrotyl cyanurate;

(2) then applying 0.05 percent to 20 percent, based on the

weight of said shaped article, of at least one compound (B) selected from acrylic acid, methacrylic acid, acrylamide, methacrylamide, N-methylolacrylamide, monopolyethyleneglycol acrylate, monopolyethyleneglycol methacrylate, monopolyethyleneglycoltrimethylammonium acrylate and methacrylate, acryloxyethylammonium chloride, acryloxyethyldimethylbenzylammonium chloride, monoethyleneglycolphosphonium acrylate and methacrylate, methoxypolyethyleneglycol acrylate and methacrylate, polyoxyethyleneglycol methacrylate, and the compounds of the formula:



wherein X represents a member selected from the radicals of the formulae,



Y represents a member selected from the radical of the formulae

$$-(CH_2CH_2O)_n-$$

and

$$-(CH_2CH\text{-}O)_m-(CH_2CH_2O)_n-$$

in which n denotes an integer of from 5 to 50 and m denotes an integer of from 1 to 20; and Z represents a member selected from a hydrogen atom and methyl radical, which is capable of imparting at least one function selected from the group consisting of anti-static, perspiration-absorbing, anti-soiling, water-absorbing, moisture-absorbing, water-repellent, oil-repellent, anti-pilling, anti-snagging, anti-flaming, anti-melting, anti-bacterial, bonding property enhancing and dyeing property-enhancing to said shaped article; and

(b) copolymerizing said compounds (A) and (B) in said shaped article.

4,438,152
PROCESS OF GASEOUS OPALIZATION OF LIGHT BULBS

Jean-Paul Barbier, Fontenay-le-Fleury, and Gilbert Lerouyer, Orgerus, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed May 5, 1982, Ser. No. 375,085

Claims priority, application France, May 20, 1981, 81 10059

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

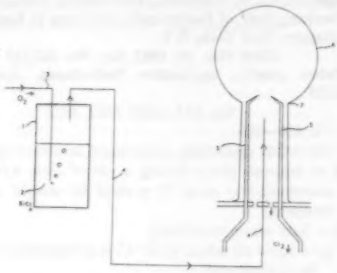
Int. Cl.³ B05D *3/04, 7/22;* **C03C** *17/345*

U.S. Cl. 427—37 **7 Claims**

1. A process for the gaseous opalization of light bulbs by producing a silica film on the inner surface of the light bulb, comprising:

entraining a chlorinated silicon compound selected from the group consisting of monochlorosilane, dichlorosilane, trichlorosilane and silicon tetrachloride in a dry carrier gas containing oxygen;

delivering said carrier gas containing oxygen and entrained chlorinated silicon compound into the presence of an



electric arc, generated by an alternating voltage between 5,000 and 10,000 volts, within the light bulb.

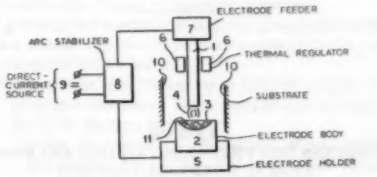
4,438,153
METHOD OF AND APPARATUS FOR THE VAPOR DEPOSITION OF MATERIAL UPON A SUBSTRATE

Eduard Pinkhasov, Forest Hills, N.Y., assignor to Welbilt Electronics Die Corporation, Bronx, N.Y.

Continuation-in-part of Ser. No. 237,670, Feb. 14, 1981, Pat. No. 4,351,855. This application Mar. 15, 1982, Ser. No. 358,186

Int. Cl.³ B05B *1/24;* **C23C** *13/00*

U.S. Cl. 427—37 **10 Claims**



1. A method of depositing a material upon a substrate, comprising the steps of:

juxtaposing said substrate with a gap between two electrodes spaced apart in a vacuum chamber;

drawing an initial vacuum in said chamber of a maximum of 10^{-6} torr;

forming a pool of material in a molten state between said electrodes;

striking an arc with a voltage of 70 to 120 volts and a current of 100 to 250 amperes at least in part between said pool and at least one of said electrodes spaced from said pool, thereby vaporizing material from said pool and depositing vapor of said material on said substrate which is in spaced relationship with said arc and in the path of vapor of material formed from said pool; and

maintaining the vacuum during the deposition of said material upon said substrate at a maximum of 10^{-5} torr.

4,438,154
METHOD OF FABRICATING AN AMORPHOUS SILICON FILM

Kazuhisa Kato, Atsugi, and Masaru Yasui, Yokohama, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1982, Ser. No. 372,826

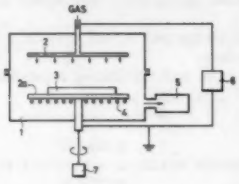
Int. Cl.³ C23C *11/00*

U.S. Cl. 427—39 **6 Claims**

1. A method of forming an amorphous silicon film photosen-

sitive receptor surface adapted for electrophotography, said method comprising the steps of:

(1) into an evacuated reaction chamber containing a discharge electrode, a substrate onto which said amorphous silicon film is to be deposited facing said discharge electrode, and a second electrode supporting said substrate, a reaction gas containing silicon hydride, introducing a gas into said reaction chamber at a rate such that the ratio (F/V) of the total flow rate (F) in liters per minute of gas



introduced relative to the volume in liters (V) of said reaction chamber is at least 0.01 min^{-1}; in combination with

(2) supplying a high frequency power across the facing electrodes in said chamber such that the power density, determined by the ratio of the supplied electric power relative to the discharge electrode's surface area, is at least 0.3 W/cm^2, thereby causing decomposition of said reaction gas and deposition of an amorphous silicon film on said substrate by glow discharge.

4,438,155

FABRICATION OF COMPOSITE METAL WIRE

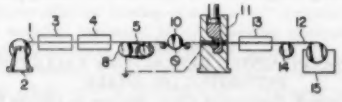
Kazumichi Kawai; Yasuo Kaneko; Keizo Abe; Hideo Matsuo; Yoshinori Kishi; Yasuhiko Miyake, and Yoshihiro Matsuyama, all of Hitachi, Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Division of Ser. No. 95,281, Nov. 19, 1979, Pat. No. 4,291,644, which is a continuation of Ser. No. 937,830, Aug. 29, 1978, abandoned. This application Jul. 10, 1981, Ser. No. 282,148

Claims priority, application Japan, Aug. 31, 1977, 52-104447; Sep. 6, 1977, 52-106922

Int. Cl.³ B05D *3/14*

U.S. Cl. 427—49 **10 Claims**



1. A method of fabricating a composite metal wire comprising the steps of: subjecting a core of hard metal to pretreatments including alignment, polishing, and cleaning and then to preheating; maintaining constant tension in the pretreated core at a constant low tension of between 5% and 50% of its breaking tension to improve adhesion between the core and a cladding material; introducing the pretreated constant low tension core into an extruder; and extruding a cladding of soft metal around the core while maintaining the constant low tension in the core.

4,438,156

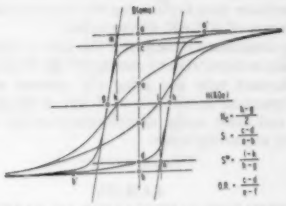
MONO-PARTICLE MAGNETIC DISPERSION IN ORGANIC POLYMERS FOR MAGNETIC RECORDING

Andrew M. Homola, Morgan Hill, and Max R. Lorenz, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,406

Int. Cl.³ H01F *10/02*

U.S. Cl. 427—57 **8 Claims**



1. A method of manufacturing a magnetic coating composition containing magnetic particles, comprising the steps of:

leaching the dry magnetic particles in an acid to form a slurry;

adjusting the pH of the said slurry to between 3 and 4 to produce a positive electrostatic charge on said magnetic particles;

adding to said slurry a dispersion of colloidal particles having a pH between 3 and 4, the colloidal particles having a negative electrostatic charge thereon;

mixing said slurry with said dispersion in a water-based system, the opposite charges on said particles causing the colloidal particles to be attracted to and irreversibly bond to the magnetic particles;

removing the coated magnetic particles from said water-based system; and

dispersing said coated magnetic particles in a water-free organic liquid binder system for application to a substrate, said colloidal particles coated on said magnetic particles preventing said magnetic particles from agglomerating to thereby improve the magnetic properties of said magnetic coating composition.

4,438,157

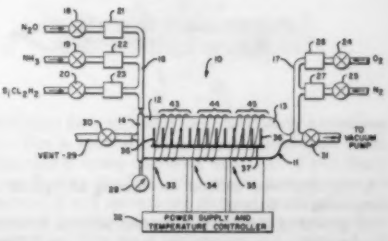
PROCESS FOR FORMING MNOS DUAL DIELECTRIC STRUCTURE

Roberto Romano-Moran, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 213,764, Dec. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 83,499, Oct. 10, 1979, abandoned. This application Jul. 12, 1982, Ser. No. 396,995

Int. Cl.³ H01L *21/316, 21/318*

U.S. Cl. 427—93 **1 Claim**



1. A process for forming continuously in the same furnace

deposition tube a silicon dioxide, silicon oxynitride and silicon nitride memory device dielectric structure on a silicon substrate comprising:

thermally oxidizing the silicon substrate in the furnace tube in a dry oxygen ambient atmospheric pressure in the range of 700°–850° C.;

forming immediately thereafter the silicon oxynitride layer on the silicon dioxide using gaseous reactants in the proportion (1–3):2:7 of N_2O, dichlorosilane and ammonia, said ammonia being introduced first into the furnace tube to prevent spurious deposits during this step, at the same temperature used for forming the silicon dioxide layer and a pressure of 400–600 millitorr; and

forming immediately thereafter the silicon nitride layer on the silicon oxynitride by cutting off the N_2O gas supply to the furnace tube and using the gaseous ammonia and dichlorosilane in the ratio of (3–4):1 at the same temperature and same range of pressure used for forming the silicon oxynitride layer.

4,438,158

METHOD FOR FABRICATION OF ELECTRICAL RESISTOR

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 220,937, Dec. 29, 1980, Pat. No. 4,377,505. This application Oct. 27, 1982, Ser. No. 437,046

Int. Cl.³ B05D *5/12*; H01C *7/00*

U.S. Cl. 427—101 **11 Claims**

1. A method for preparing an electrical resistor, comprising the steps of: combining a curable polymeric binder and finely-divided particles, having a particle size of less than 50 microns, of at least one member of the group consisting of the brown oxide of molybdenum and the brown, purple, blue and yellow oxides of tungsten; adjusting the amount of said oxides to be about 60–80 volume percent of the mixture of said oxides and said binder and sufficient to provide a desired bulk resistivity after curing; applying the resulting admixture to a substrate; and curing said binder.

4,438,159

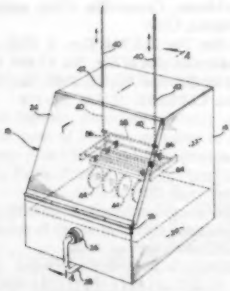
COATING PROCESS

Hermann Weber, Tarzana, Calif., assignor to Techsight Corporation, Wilmington, Del.

Filed Mar. 8, 1982, Ser. No. 355,362

Int. Cl.³ G02B *1/10*; B05D *1/18*

U.S. Cl. 427—162 **5 Claims**



1. An improved method for coating an optical material comprising the steps of:

(a) providing a volume of coating solution in an enclosed housing;

(b) providing an atmosphere substantially saturated with said coating solution;

(c) suspending said optical material above the surface of said volume of coating solution;

(d) lowering said optical material into said coating solution;

(e) maintaining said optical material within said coating solution for a predetermined time such that the temperature of said material generally equals the temperature of said solution;

(f) progressively withdrawing said optical material out of said volume of coating solution;

(g) suspending said optical material above said coating solution within said saturated atmosphere for a predetermined time;

(h) withdrawing said optical material from said saturated atmosphere;

whereby a more uniform coating is provided on said optical material.

4,438,160

METHOD OF MAKING A ROTARY BALL DISPLAY DEVICE

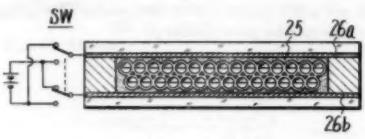
Reiji Ishikawa; Masaki Saito; Toshio Mori, and Hidemasa Tamura, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,546

Claims priority, application Japan, Jan. 18, 1982, 57-5806; Jan. 18, 1982, 57-5807

Int. Cl.³ G09G *3/00*; B05D *7/00*

U.S. Cl. 427—214 **8 Claims**



1. A method of making a rotary ball display device which comprises:

providing a plurality of ball members each having a hemispherical surface of a color different than the other hemispherical surface thereof,

coating said ball members with a thin coating,

settling the coated ball members into a low viscosity liquid to form a layer of coated ball members, said thin coating being insoluble in said low viscosity liquid,

pouring a high molecular weight hardenable coating material soluble in said low viscosity liquid into said coated ball members to cover said layer,

removing said low viscosity liquid,

hardening said hardenable coating material,

dissolving away said thin coating from said ball members to leave cavity portions thereabout, and

introducing a high resistivity liquid into said cavity portions.

4,438,161

IRON-CONTAINING REFRACTORY BALLS FOR RETORTING OIL SHALE

Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 209,926, Nov. 24, 1980, Pat. No. 4,371,481, which is a division of Ser. No. 9,627, Feb. 6, 1979, Pat. No. 4,360,565, which is a division of Ser. No. 837,130, Sep. 28, 1977, Pat. No. 4,160,719. This application Sep. 30, 1982, Ser. No. 430,627

Int. Cl.³ B05D *7/00*; B32B *15/02*

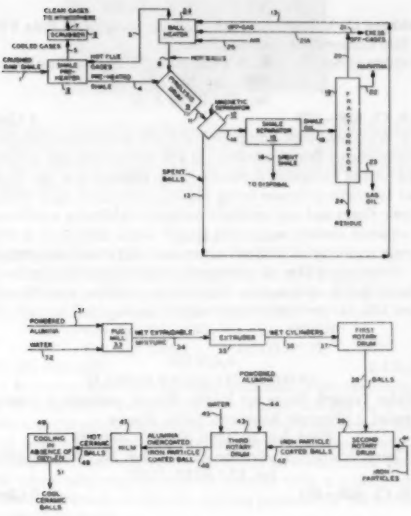
U.S. Cl. 427—215 **5 Claims**

1. A process for preparing iron-containing ceramic balls, containing about 10 to 90 weight percent iron and the balance a high refractory ceramic-alumina, which comprises:

(a) tumbling iron shot with finely divided powdered refrac-

tory-grade alumina of about 5 to 10 micron particle size and with sufficient water to provide an alumina coating on each said shot,

(b) heating said alumina coating iron shot to a temperature of about 2800° F. to 3400° F. for a time sufficient to result in said iron-containing ceramic balls, and



(c) cooling said iron-containing ceramic balls in the substantial absence of molecular oxygen,

wherein said iron-containing ceramic balls contain in cross-section a metallic iron core and a ceramic-alumina over-coating.

4,438,162

MODIFIED IONOMER BLEND AND APPLICATION THEREOF

Wayne F. Nelson, Akron, Ohio, assignor to A. Schulman, Inc., Akron, Ohio

Division of Ser. No. 260,180, May 4, 1981, Pat. No. 4,371,583. This application Sep. 17, 1982, Ser. No. 419,528

Int. Cl.³ B32B *31/00, 27/20*

U.S. Cl. 427—318 **6 Claims**

1. A process for preparing a metal edging with a tough, non-glossy adherent coating or inlay which comprises preparing a modified ionomeric blend consisting essentially of an intimate admixture of (1) about 20 to 60 percent of an ethylene-propylene rubber, in which ethylene is the predominant component, (2) about 40 to 80 percent of a copolymer containing ethylene units and carboxylic acid containing units, said copolymer containing between about 25 and 98.5 percent ethylene units and between about 1.5 and 30 percent acid containing units, and said carboxylic acid units being from 10 to 100 percent neutralized with metallic ions, and (3) an effective amount up to about 10 percent of an ultraviolet stabilizing coloring material selected from the group consisting of

(1) carbon black, and

(2) a pigment plus an ultraviolet stabilizer, with or without an antioxidant,

cleaning the metal edging, heating the metal edging and flowing said blend onto a cleaned, heated surface of said metal.

4,438,163

PAD WITH SHAPE ADAPTING PROPERTIES

Karl G. B. Andersson, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden

Filed May 28, 1981, Ser. No. 268,082

Claims priority, application Sweden, May 30, 1980, 8004063

Int. Cl.³ B32B *23/02*

U.S. Cl. 428—35 **16 Claims**

1. A configuration conforming pad comprising at least two adjacently located superposed layers of flexible material, joined together at the surrounding outer edge portions thereof, each of the layers including an attached tongue-shaped flap defined by cuts in the layer from which it is formed, said tongue-shaped flaps being disposed in overlapping relationship and adapted to be folded out of the plane of their respective layers along the line of attachment and slideably and overlappingly repositioned to substantially surround and conform to an object placed in the pad.

4,438,164

CONTAINERS FOR X-RAY FILMS OR THE LIKE

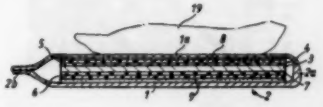
Josef Pfeifer, Unterhaching, and Alfred Rheude, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 134,925, Mar. 28, 1980, abandoned. This application Jan. 20, 1982, Ser. No. 341,193

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912668

Int. Cl.³ G03B *41/16;* **B32B** *15/08;* **B65D** *85/48*

U.S. Cl. 428—35 **22 Claims**



1. A container for a sheet-like film, particularly a container wherein a film is inserted between two spaced-apart walls, comprising carrier means consisting essentially of two sheet-like carriers flanking the film; a fluorescent stratum mounted on at least one of said carriers and disposed intermediate said one carrier and the film between said carriers; a magnetic first layer mounted on a first one of said carriers; and a second layer mounted on a second one of said carriers, said layers attracting one another so that said stratum is biased against the film.

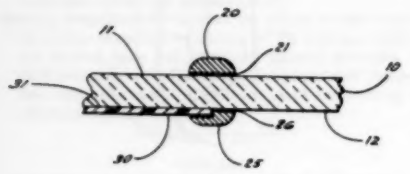
4,438,165
SIMULATED STAINED AND LEADED GLASS WINDOWS

Donald R. Butler, Newport Beach, Calif., assignor to Stained Glass Overlay, Inc., Mission Viejo, Calif.

Continuation-in-part of Ser. No. 158,919, Jun. 12, 1980, Pat. No 4,335,170, which is a continuation of Ser. No. 962,123, Nov. 20, 1978, abandoned. This application Jun. 10, 1982, Ser. No. 386,987

Int. Cl.³ B32B *17/10*; **B44F** *1/06*

U.S. Cl. 428—38 **5 Claims**



1. A simulated stained and leaded glass window structure comprising:

a. a pane substantially clear glass or plastic having a smooth first side and a smooth second side;

b. A plurality of lead strips adhered to the first side of the pane and forming closed design segments thereof;

c. a plurality of polyester plastic film segment coatings having on one side, color coatings simulating stained glass and on their undersurfaces, a pressure-sensitive adhesive coating affixed to the second side of the pane coinciding with the closed design segments, thereby imparting color thereto; and

d. a plurality of second lead strips adhered to the second side of the pane in coincidental alignment with the lead strips adhered to the first side of the pane, and overlaying the joint lines between adjacent plastic film segment coatings.

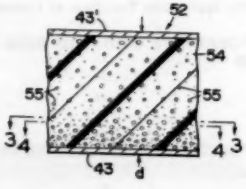
4,438,166
STRUCTURAL LAMINATE AND METHOD FOR MAKING SAME

David G. Gluck, and Leon F. Barry, both of St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Feb. 4, 1983, Ser. No. 463,786

Int. Cl.³ B32B *5/20, 5/28, 31/12*

U.S. Cl. 428—113 **20 Claims**



13. A structural laminate comprising:

(a) a rigid foam having two major, substantially planar, substantially parallel surfaces, one of the major surfaces of the rigid foam being attached to a planar facing sheet, the facing sheet having an adhesive coating disposed on the inner surface thereof and interposed between the facing sheet and the rigid foam, and

(b) a network of glass fibers wherein:

(1) the glass fibers are distributed in the rigid foam,

(2) the glass fibers are greater than one foot in length,

(3) the glass fibers are arranged in layers,

(4) each layer of glass fibers is substantially parallel to the facing sheet, and

(5) the network of glass fibers is secured to the adhesive coating of the facing sheet through attachments between the adhesive coating and glass fibers of the network proximate to the adhesive coating.

4,438,167
NOVEL POROUS FABRIC

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Biax Fiberfilm Corporation, Neenah, Wis.

Division of Ser. No. 85,228, Oct. 15, 1979. This application Nov. 6, 1980, Ser. No. 204,578

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—138 **4 Claims**

1. A porous fabric comprised of a web of elongated synthetic thermoplastic fibers imbedded in a film of a synthetic polymer, said web of elongated synthetic fibers imbedded in said film of said synthetic polymer being biaxially stretched, said thermoplastic fibers and said synthetic polymer exhibiting a difference in aqueous contact angle of at least 5° and a difference in initial tensile modulus of 5000 psi between a web of said thermoplastic fibers and a film of said synthetic polymer when individually stretched, said porous fabric having surface openings of at least 100,000 perforations per square inch.

4,438,168
COMPOSITE HEAT SHIELD

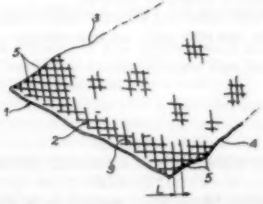
Olivier Testard, Bures sur Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 22, 1982, Ser. No. 400,888

Claims priority, application France, Jul. 30, 1981, 81 14868

Int. Cl.³ B32B *23/02*

U.S. Cl. 428—193 **9 Claims**



1. A heat shield comprising at least one thermally insulating assembly formed by a reflecting layer and a spacing layer, wherein the spacing layer is made from tulle, and wherein the spacing layer and the reflecting layer are welded to one another at their edges.

4,438,169
COLORED OPAQUE PRINTING OF TEXTILE FABRICS USING DYESTUFFS

John Y. Daniels, Pineville, N.C., and James C. Stevenson, Rock Hill, S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

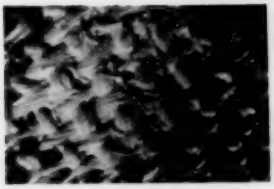
Continuation-in-part of Ser. No. 429,794, Sep. 30, 1982, which is a continuation-in-part of Ser. No. 294,782, Aug. 20, 1981, abandoned. This application Oct. 22, 1982, Ser. No. 435,949

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—196 **12 Claims**

1. A printed textile fabric formed of interengaged yarns of a predetermined color, selected areas of said fabric having printed pattern areas of predetermined color contrasting with the color of said yarns, said printed pattern areas being substantially opaque and thus unaffected by the color of said yarns, and said pattern areas comprising an opaque coating covering

the exposed surfaces of the interengaged yarns and hiding the underlying color of the yarns, said coating comprising an opacifying pigment providing opacity in said coating and a



cured water insoluble polymer binder affixed to said yarns and bonding said opacifying pigment to the yarns, and a dye coloring said polymer binder and thereby imparting said predetermined color to the printed area.

4,438,170

ELECTROSENSITIVE RECORDING MATERIALS WITH HETEROGENEOUS SURFACE TOPOLOGY

John P. McCue, Holyoke, Mass., assignor to Philip Morris Industrial Incorporated, New York, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,610
Int. Cl.³ B44D *1/16*; G01D *15/08*
U.S. Cl. 428—207 **6 Claims**

1. In electrosensitive recording materials of the type including (a) a substrate web, (b) an intermediate colored layer on a surface of the substrate web, and (c) a vacuum-deposited metal layer over the intermediate layer, which recording materials develop an image when portions of the metal layer are vaporized when subjected to electric current from a printhead in contact therewith to thereby expose portions of the colored intermediate layer,

the improvement wherein:

(1) the substrate is a web of paper of plastic film with a first surface having a smoothness of 20 or less Sheffield units and an ink absorption characteristic providing a brightness loss of 10 to 40 units;

(2) the intermediate layer is on the first surface of the substrate web and includes

(a) a thermally stable organic film-forming binder,

(b) small-sized solid parrticulates having a particle size range of 0.1 to 2.0 microns average diameter, and

(c) large-sized solid particulates having a particle size range of 2 to 39 microns with a median particle size of 3 to 12 microns,

the binder forming a film adhering the small-sized and large-sized particulates to the first surface of the substrate, the particulates being partially embedded in the film with the large-sized particulates having portions protruding from the film and extending beyond portions of the small-sized particulates protruding from the film, the intermediate layer thereby having a heterogeneous surface topology formed by the small-sized particulates dispersed within agglomerates of the large-sized particulates; and

(3) the vacuum-deposited metal layer is a thin even layer of metal extending over and conforming to the heterogeneous surface topology of the intermediate layer.

4,438,171

COEXTRUDED PRODUCT OF AES-THERMOPLASTIC GRAFT COPOLYMER

John M. Wefer, Newtown, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,599
Int. Cl.³ B32B *7/02, 27/08*
U.S. Cl. 428—215 **7 Claims**

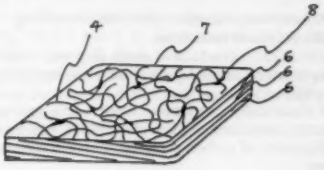
1. A coextruded product having a total thickness of from 25 to 500 mils, and at least one surface layer having a thickness of from 3 to 150 mils of graft copolymer composition comprising a graft copolymer of resin-forming material selected from vinyl aromatic, alkenoic nitrile, alkenoic ester and alkenoic acid monomers on ethylene-propylene-dicyclopentadiene terpolymer rubber, said surface layer containing up to 10 parts by weight of pigment per 100 parts of graft copolymer composition.

4,438,172

HEAT RETAINING SHEET

Ando Katsutoshi, and Nishiura Eiichi, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP81/00115, § 371 Date Jan. 27, 1982, § 102(e) Date Jan. 27, 1982, PCT Pub. No. WO81/03503, PCT Pub. Date Dec. 10, 1981
PCT Filed May 27, 1981, Ser. No. 354,097
Claims priority, application Japan, May 28, 1980, 55-72516; Dec. 2, 1980, 55-169176
Int. Cl.³ B32B *27/02, 27/36*
U.S. Cl. 428—220 **32 Claims**



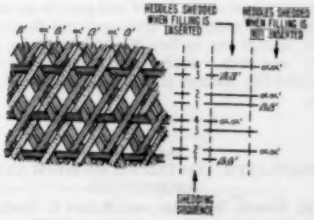
1. A heat retaining sheet comprising a web formed by mutually bonding fibers containing polybutylene terephthalate, said fibers having a definite fiber length, being substantially undrawn and substantially uncrimped and having an average fineness of up to about 15 denier and a fineness distribution ranging from 0.001 to 40 denier, said web having area shrinkage in boiling weter of up to about 20%.

4,438,173

TRIAXIAL FABRIC

Wayne C. Trost, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Jul. 21, 1983, Ser. No. 515,786
Int. Cl.³ B32G *7/08*
U.S. Cl. 428—221 **15 Claims**



1. A pliable, triaxial fabric comprising at least three sets of interwoven, angularly intersecting parallel yarn courses, at least one of said sets including at least one unstabilized yarn course substantially free of interwoven relationships with intersecting yarn courses, the remaining yarn courses being substantially interwoven with intersecting yarn courses, said fabric being weavable on a conventional, bi-plain triaxial fabric-forming machine.

4,438,174

POLYESTER ANTISTATIC LAMINATE MATERIALS

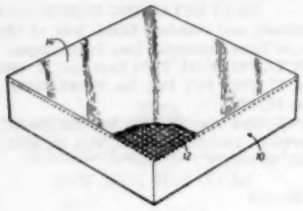
Bruce R. Whewell, 7 Singers Close, Henley-on-Thames, Oxfordshire, England

Filed May 13, 1982, Ser. No. 377,783

Claims priority, application United Kingdom, Jul. 14, 1981, 8121590

Int. Cl.³ B32B 7/00

U.S. Cl. 428—247 9 Claims



1. An anti-static laminate material comprising

a thin polyester resin layer,

an electrically conductive mesh disposed within said resin layer at or immediately below its operationally upper surface,

said electrically conductive mesh being selected from the group consisting of glass cloth tissue, impregnated with a dispersion of carbon particles, and thin carbon-fibre mesh, and

one or more backing layers of polyester resin and/or conventional fibre-glass.

4,438,175

SYNTHETIC FILM WITH A PAPER-LIKE SURFACE AND METHOD OF FORMING SAME

Charles R. Ashcraft, Victor, and Kurt D. Albertson, Macedon, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,426

Int. Cl.³ B32B 3/26, 7/02

U.S. Cl. 428—315.5 23 Claims

1. An oriented polymeric film structure comprising:

at least one layer of a thermoplastic polymeric matrix material, within which is located a strata of voids, positioned at least substantially within at least a substantial number of said voids at least one void-initiating solid particle which is phase-distinct and incompatible with said matrix, the void space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximately a corresponding cross-sectional dimension of said void, at least one surface of said layer being of a paper-like, non-even, micro-rough, microcrater-containing lamellae-like, random textured, ink-acceptable configuration.

4,438,176

THERMOPLASTIC COATED FILMS WITH ANTI-STATIC PROPERTIES

Robert H. Steiner, Rochester, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 970,719, Dec. 18, 1978, abandoned. This application Jan. 12, 1983, Ser. No. 457,533

Int. Cl.³ B32B 27/00

U.S. Cl. 428—349 2 Claims

1. A multi-layer thermoplastic film of improved anti-static characteristics consisting essentially of a film substrate consisting essentially of polypropylene having coated on at least one surface thereof a primer coating consisting essentially of poly-(ethylene-imine), said primer coating having a topcoating thereon comprising a vinylidene chloride polymer in admixture with an anti-static proportion of a low molecular weight glycol, said vinylidene chloride top coating retaining its inherent heat seal characteristics.

4,438,177

CURED PRESSURE SENSITIVE ADHESIVES

William D. Potter, Bishop's Stortford Herts, and Sinan B. Kiamil, Harlow, both of United Kingdom, assignors to Smith and Nephew Associated Companies Ltd., London, England

Filed Jun. 16, 1982, Ser. No. 389,009

Claims priority, application United Kingdom, Jun. 17, 1981, 81-18666

Int. Cl.³ B05D 3/06

U.S. Cl. 428—355 16 Claims

1. Process for the preparation of an adhesive layer on a substrate which comprises applying to a substrate a composition of an acrylate rendered curable by the presence of a crosslinking agent and curing it by electron beam radiation characterised in that the curable composition consists essentially of a liquid alkyl acrylate polymer having a K value of 10 to 30 and a polyfunctional acrylate or methacrylate crosslinking agent said liquid alkyl acrylate polymer containing copolymerisable polyfunctional acrylate or methacrylate monomer units to provide an additional crosslinking agent.

14. An industrial tape carrying a cured acrylate pressure sensitive adhesive made by the process of claim 1.

15. A surgical dressing carrying a cured acrylic pressure sensitive adhesive made by the process of any claim 1.

4,438,178

ADHESIVE ACTIVATED POLYESTER FIBROUS MATERIAL

Edward J. Powers, Louisville, Ky., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Oct. 27, 1982, Ser. No. 437,043

Int. Cl.³ D04H 1/58; B32B 27/34; D02G 3/00

U.S. Cl. 428—289 11 Claims

1. A multi-filament polyester fibrous material for incorporation into rubber which is coated with a finish comprising, as the active ingredient, a composition of the formula: $R—(O—CH_2CHOH—CH_2—Cl)_x$ wherein R represents the residue of a polyhydric alcohol or polycarboxylic acid and contains up to 20 carbon atoms and x represents a number greater than one.

4,438,179

RESIN PARTICLES WITH MAGNETIC PARTICLES BONDED TO SURFACE

Jitka Solc, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 3, 1982, Ser. No. 345,305

Int. Cl.³ B32B 5/16

U.S. Cl. 428—407 2 Claims

1. A synthetic resinous particle having a diameter of from about 1–150 microns, the particle having bonded to the surface thereof a coating comprising a magnetic layer, the magnetic layer being of flocculated magnetic particles being bonded to the surface thereof, the bonding layer comprising a water swellable polymer grafted to the surface of the particle.

4,438,180

PROCESS FOR COATING NYLON FILM WITH VINYLIDENE CHLORIDE COPOLYMERS

Theodore J. Lang, and Bernard J. Kershaw, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Aug. 16, 1982, Ser. No. 408,492
Claims priority, application Canada, Aug. 27, 1981, 384698; Dec. 1, 1981, 391235
Int. Cl.³ B23B 27/08
U.S. Cl. 428—475.8 10 Claims

1. A nylon film coated with a vinylidene chloride copolymer, said film having been prepared by a process comprising:

(a) coating the nylon film with an aqueous dispersion of a vinylidene chloride copolymer while keeping the nylon film under sufficient machine and transverse direction tensions to prevent curling, to form a primer-coated film, said vinyldiene chloride copolymer having a crystallinity index of less than 1.15, when dry, after 30 days' storage at 20° C., and a crystallinity index, when dry, between about 1.05 and 1.20 when stored for 48 hours at 40° C.;

(b) drying the primer-coated film to remove substantially all of the water from the dispersion, while maintaining the primer-coated film under said machine and transverse direction tensions and at a drying rate sufficiently high to prevent curling of the primer-coated film;

(c) coating the primer-coated film with an aqueous dispersion of a vinylidene chloride copolymer which, when dry, is capable of developing crystallinity to a level sufficient that the crystalline vinylidene chloride copolymer so-formed resists attack by an organic solvent, as measured by the Solvent Haze Test, said organic solvent being capable of dissolving vinylidene chloride copolymers having a crystallinity index of less than 1.05, to form a vinylidene chloride copolymer coated film; and

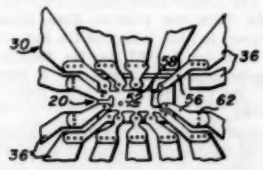
(d) drying the vinylidene chloride copolymer coated film.

4,438,181

ELECTRONIC COMPONENT BONDING TAPE

Jon M. Schroeder, 4327 Estate Dr., Stockton, Calif. 95209, assignor to Jon M. Schroeder, Stockton, Calif.

Filed Jan. 13, 1981, Ser. No. 224,668
Int. Cl.³ H01L 23/48
U.S. Cl. 428—571 7 Claims



1. An integral, preformed tape for thermocompression bonding comprising:

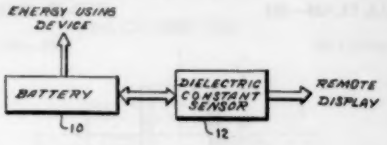
a tape of conductive material with first bonding surface and a pressure pad surface opposite to the bonding surface with a contact pad bonding pressure pad protruding from said pressure pad surface, said tape having formed thereon a chip bonding site wherein apertures are formed through said tape to establish longitudinal edges of an electrically conductive lead, said lead having a contact pad terminal end region for bonding to an electrical contact pad formed on a surface of an electronic component chip, said contact pad bonding pressure pad being formed from a material which is harder than said tape material in the thermocompression bonding temperature range and located so as to protrude from said pressure pad surface at said contact pad terminal end region.

4,438,182

METHOD OF DETERMINING BATTERY LIFE

Harold A. Papazian, Littleton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 431,496
Int. Cl.³ H01M 6/00
U.S. Cl. 429—91 4 Claims



1. A method of determining the status of a battery comprising the steps of:

measuring a dielectric constant of an electrolyte of the battery;

comparing the dielectric constant obtained during said measuring to predetermined values, the predetermined values indicating battery status at the measured dielectric constant; and

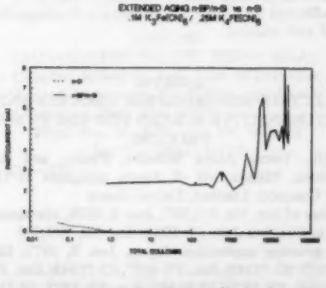
outputting the status of the battery based upon said step of comparing the measured dielectric constant to said predetermined values.

4,438,183

PHOTOELECTROCHEMICAL CELL HAVING PHOTOANODE WITH THIN BORON PHOSPHIDE COATING AS A CORROSION RESISTANT LAYER

Richard J. Baughman, and David S. Ginley, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 25, 1982, Ser. No. 411,396
Int. Cl.³ H01M 6/36
U.S. Cl. 429—111 8 Claims



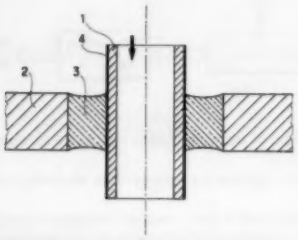
1. In a photoelectrochemical cell device comprising a photoanode, the improvement comprising a film of boron phosphide on said photoanode as a stable photoelectrode layer and as a corrosion resistant protecting film for said photoanode, whereby the surface of said photoanode is rendered resistant to electrocorrosion and photocorrosion and thereby stabilized and simultaneously provided with photoresponse properties.

4,438,184

SEALED PASSAGE FOR A NEGATIVE TERMINAL THROUGH A METAL WALL, AND ELECTRIC CELL USING SAID SEALED PASSAGE

Bernard Chenaux, Poitiers, France, assignor to Gipelec, Levallois-Perret, France

Filed Jul. 12, 1982, Ser. No. 397,436
Claims priority, application France, Jul. 21, 1981, 81 14151
Int. Cl.³ H01M *2/06*
U.S. Cl. 429—181 **6 Claims**



1. A sealed passage for a negative terminal through a metal wall, wherein the sealing between said terminal and the metal wall is provided by a glass seal, and wherein at least that portion of the terminal which comes into contact with the glass seal is covered with a layer of at least one electrically insulating oxide.

4,438,185

HYDROPHILIC POLYMER COATED MICROPOROUS MEMBRANES CAPABLE OF USE AS A BATTERY SEPARATOR

Henry T. Taskier, Fanwood, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 174,146, Jul. 31, 1980, Pat. No. 4,359,510. This application Sep. 3, 1982, Ser. No. 414,747
Int. Cl.³ H01M *2/16*
U.S. Cl. 429—250 **4 Claims**

1. A process for rendering a normally hydrophobic microporous membrane hydrophilic and reducing the electrical resistance thereof which comprises applying a coating to the surface of said membrane in a manner sufficient to achieve a coating thickness when dry of from about 1 to about 25 microns, said coating being selected from the group consisting of cellulose esters, and polyvinyl alcohol, and impregnating said membrane with a surfactant in a manner and in at least an amount sufficient to render the membrane hydrophilic in the absence of said coating.

4,438,186

ELECTROPHOTOGRAPHIC PROCESS AND PHOTOSENSITIVE SCREEN FOR USE IN SUCH PROCESS

Eiichi Sato, Tama; Akira Shimizu, Fuchu, and Kazuhisa Yanagisawa, Mitaka, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 913,907, Jun. 8, 1978, abandoned. This application Jun. 19, 1981, Ser. No. 275,588
Claims priority, application Japan, Jun. 9, 1977, 52-68118; Jun. 17, 1977, 52-71142; Jun. 17, 1977, 52-71143; Jun. 17, 1977, 52-71144; Jun. 17, 1977, 52-71145; Jun. 17, 1977, 52-71146
Int. Cl.³ G03G *15/00*
U.S. Cl. 430—53 **22 Claims**

1. A process for electrophotographically forming a duplicated copy of a document with the aid of a photosensitive screen defined by an electrically conductive sheet-like member having a plurality of fine apertures, a first photoconductive layer applied on one side of the conductive memeber, a second photoconductive layer applied on the other side of the conductive member, an electrically insulating layer applied on the second photoconductive layer, said sheet-like conductive member being completely covered with said first and second photoconductive layers and the insulating layer, whereby corona ions do not flow directly into said sheet-like conductive member when said member is exposed to a corona discharge, said process including the steps of: forming a primary electrostatic charge image of the document; subjecting the insulating layer side of said photosenstive screen simultaneously to an imagewise exposure corresponding to the image of the document and to an electrostatic charge while the first photoconductive layer is maintained highly resistive in an imagewise dark portion; subjecting at least the first photoconductive layer of the screen to a uniform exposure so as to form a primary charge image having a high surface potential and trapped capacitively across the insulating layer in a stable manner, any other portion of the screen being free from any charge; positioning a charge retentive member opposite the insulating layer side of said photosensitive screen; and forming a secondary electrostatic charge image on the charge retentive member by projecting an ion stream toward the charge retentive member through the photosensitive screen from the side of the first photoconductive layer, while the first photoconductive layer is maintained highly conductive, whereby any charge which might deteriorate the primary charge image on the screen is inhibited from deposit on the first photoconductive layer and the ion stream is modulated in accordance with the primary charge image on the screen.

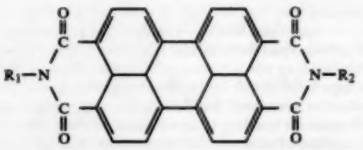
4,438,187

PHOTOSENSITIVE COMPOSITION FOR ELECTROPHOTOGRAPHY WITH CHLORONAPHTHOQUINONES

Akira Fushida, Suita, and Yoshiaki Kato, Hirakata, both of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Apr. 7, 1982, Ser. No. 366,331
Claims priority, application Japan, Apr. 6, 1981, 56-50579
Int. Cl.³ G03G *5/06, 5/07, 5/09*
U.S. Cl. 430—81 **7 Claims**

1. A photosensitive plate for electrophotography, consisting essentially of an electrically conductive support and a photosensitive layer thereon, said photosensitive layer comprising 100 parts by weight of polyvinylcarbazole, 10 to 30 parts by weight of a perylene pigment represented by the following general formula



(2)

wherein R_1 and R_2 is a hydrogen atom or a substituted or unsubstituted alkyl or aryl group,

and 10 to 30 parts by weight of 2,3-dichloro-1,4-naphthoquinone.

4,438,188

METHOD FOR PRODUCING PHOTOSENSITIVE FILM FOR ELECTROPHOTOGRAPHY

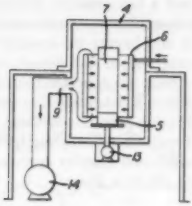
Michiro Shimatani, Fujisawa, and Toyoki Kazama, Yokosuka, both of Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Jun. 10, 1982, Ser. No. 387,221

Claims priority, application Japan, Jun. 15, 1981, 56-91753; Sep. 24, 1981, 56-150946; Sep. 24, 1981, 56-150948

Int. Cl.³ G03G 5/082

U.S. Cl. 430—128 9 Claims



1. In a method of producing a photosensitive film on a substrate surface including generating a glow discharge in a space between a cylindrical conductive substrate coaxially supported by a rotatable support arranged in a reaction chamber and a cylindrical electrode coaxially opposed to the surface of said cylindrical conductive substrate to decompose a reaction gas introduced into said reaction chamber, said method comprising previously cleaning said surface of said substrate, and supplying or exhausting said reaction gas to or from said space between said substrate and said electrode so as to be uniformly dispersed in an axial direction of at least said substrate.

4,438,189

RADIATION-POLYMERIZABLE MIXTURE AND PHOTOPOLYMERIZABLE COPYING MATERIAL PREPARED THEREFROM

Ulrich Geissler, Frankfurt, and Walter Herwig, Bad Soden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,488

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134123

Int. Cl.³ G03C 1/68

U.S. Cl. 430—280 24 Claims

1. A radiation-polymerizable mixture consisting essentially of (a) a compound which has at least two terminal ethylenically unsaturated groups and which can form a crosslinked polymer by free radical initiated chain addition polymerization (b) a polymeric binder which is insoluble in water and at least swellable in aqueous alkaline solutions, (c) a radiation-activatable polymerization initiator, and (d) a compound which is thermally crosslinkable with a material selected from the group consisting of the polymeric binder (b), the polymerization product of compound (a), and itself, and which, if the crosslinking groups of said compound (d) are epoxy groups, has at least three epoxy groups.

4,438,190

PHOTOSENSITIVE RESIN COMPOSITION CONTAINING UNSATURATED MONOMERS AND UNSATURATED PHOSPHATES

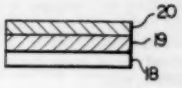
Toshiaki Ishimaru; Katsushige Tsukada, and Nobuyuki Hayashi, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,765

Claims priority, application Japan, Mar. 4, 1981, 56-31808; Mar. 10, 1981, 56-34779

Int. Cl.³ G03C 1/68

U.S. Cl. 430—281 14 Claims



1. A photosensitive resin composition for the preparation of a solder resist comprising:

(a) at least one compound selected from the group consisting of benzotriazole, benzimidazole, benzothiazole, derivatives thereof and and salts thereof, the derivatives of benzotriazole, benzimidazole, and benzothiazole being those obtained by substituting one or more hydrogen atoms in said compounds with one or more alkyl groups, aryl groups, nitro groups, amino groups, hydroxyl groups, carboxyl groups or halogens,

(b) an unsaturated organic phosphate compound having photopolymerizable ethylenically unsaturated bonds selected from the group consisting of acid phosphoxyethyl methacrylate, 3-chloro-2-acid phosphoxypropyl methacrylate, bis(methacryloxyethyl)phosphate, acryloxyethyl phosphate, bis(acryloxyethyl)phosphate, bis(2-chloroethyl)vinyl phosphate and 1,2-bis(carboxyallyl)ethyldibutyl phosphate,

(c) 20 to 40 parts by weight of a vinyl copolymer,

(d) 20 to 80 parts by weight of a photopolymerizable unsaturated compound having at least one terminal ethylene group, and

(e) 0.5 to 10 parts by weight of a sensitizer and/or a sensitizer system other than component (a) capable of initiating polymerization of components (b) and (d) upon irradiation of actinic light; the amount of component (a) being about 0.001% by weight or more and the amount of component (b) being about 0.001% by weight or more based on the weight of the photosensitive resin composition.

4,438,191

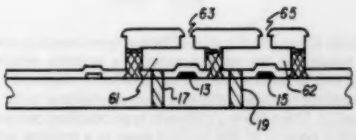
MONOLITHIC INK JET PRINT HEAD

Frank L. Cloutier; Robert N. Low, both of Corvallis, and Paul H. McClelland, Monmouth, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 23, 1982, Ser. No. 443,971

Int. Cl.³ G01D 15/18

U.S. Cl. 430—324 12 Claims



1. In a method for constructing a monolithic bubble-driven ink jet print head having a substrate and a heat source attached to said substrate for producing bubbles, the steps comprising:

forming an electrically conductive foundation surrounding said heat source, said foundation attached to said substrate;

applying a first resist over said substrate and said heat source;

exposing said first resist to define a wall over said foundation, said wall forming a perimeter surrounding said heat source;

removing those portions of said first resist where said wall is to be located;

depositing a first metal layer onto said foundation to form said wall;

forming a conductive surface over the remaining portions of said first resist which are contained within said perimeter;

applying a second resist over said conductive surface;

exposing said second resist to define an orifice;

depositing a second metal layer over said wall and said conductive surface; and

stripping away said first and second resist and those portions of said conductive surface formed over said first resist, to provide a monolithic print head with a void therein defined by said wall and said metal layer, and to provide an orifice in said second metal layer, said void communicating with said orifice.

4,438,192

PHOTORESIST STRIPPER COMPOSITION AND METHOD OF USE

Wesley L. Archer, Midland, Mich.; Vicki A. Lynn, Indianapolis, Ind., and Susan M. Dallessandro, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 14, 1983, Ser. No. 465,975

Int. Cl.³ B08B *3/08*; C11D *7/50*; C23G *5/02*

U.S. Cl. 430—329 **9 Claims**

1. A composition suitable for stripping cross-linked photoresist polymer which comprises methylene chloride containing methanol and methyl formate, each in amounts of from about 1 to about 10 percent by volume of the total mixture, providing that the total amount of methanol and methyl formate is at least about 5 and not more than about 10 volume percent of the total mixture.

4,438,193

SILVER HALIDE PHOTOSENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Morito Uemura; Kenichi Kishi; Satoshi Nakagawa, and Shuji Kida, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

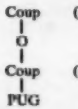
Filed Dec. 21, 1981, Ser. No. 332,962

Claims priority, application Japan, Dec. 27, 1980, 55-188974

Int. Cl.³ G03C *1/46, 7/26*

U.S. Cl. 430—505 **9 Claims**

1. A silver halide photosensitive color photographic material comprising a coupler of the formula



wherein Coup (A) is a non-diffusion type coupling component (A) bonded to the oxygen atom at a position which enables Coup (A) to form a colored or colorless compound as a result of coupling with and releasing from an oxidized color developing agent, Coup (B) is a diffusion type coupling component (B) which is bonded to the oxygen atom in a position which enables Coup (B) to split off from said Coup (A) and form a coupling reaction product with said oxidized color developing agent, and PUG is a development inhibitor which is released when Coup (B) undergoes said coupling reaction.

4,438,194

SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Fumio Hamada, Fussa, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Japan

Filed Mar. 19, 1982, Ser. No. 359,914

Claims priority, application Japan, Mar. 20, 1981, 56-42117

Int. Cl.³ G03C *1/46*

U.S. Cl. 430—505 **4 Claims**

1. A silver halide color photographic photosensitive material comprising a base having thereon a non-photosensitive intermediate layer sandwiched between a high-sensitive silver halide emulsion layer and a low-sensitive silver halide emulsion layer both having a nondiffusion coupler that forms substantially the same color and having photosensitivity in substantially the same spectral region, said non-photosensitive intermediate layer having been incorporated therein with a nondiffusion coupler that forms substantially the same color as that formed by the nondiffusion coupler contained in said high-sensitive emulsion layer and whose coupling speed is not greater than that of the nondiffusion coupler contained in said high-sensitive silver halide emulsion layer.

4,438,195

PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A DEVELOPER COMPOUND

Friedrich-Wilhelm Kunitz, Leverkusen, and Karl-Wilhelm Schranz, Odenthal, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 3, 1982, Ser. No. 438,965

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145288

Int. Cl.³ G03C *1/06*

U.S. Cl. 430—566 **7 Claims**

1. In a photographic recording material comprising at least one light-sensitive silver halide emulsion layer and at least one layer containing a silver-halide-developer compound containing at least one amino group, the improvement according to which the silver-halide-developer compound is contained in the layer in salt form bound to an ion exchanger.

4,438,196

IMMOBILIZATION OF BIOCATALYSTS ON GRANULAR CARBON

Oreste J. Lantero, Jr., Goshen, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 28, 1982, Ser. No. 425,942

Int. Cl.³ C12P *19/20*; C12N *11/02, 11/08, 11/06*

U.S. Cl. 435—96 **18 Claims**

9. An immobilized enzyme conjugate comprising porous, granular, activated carbon having a particle size of from 12 to 40 mesh on the U.S. sieve series, pore dimensions of from 35 to 1,000 Å in radius and a surface area of from 200 to 600 m^2/gm as a support having attached thereto the reaction product of a polyamine compound having pendant amine groups, an amine reactive material which is a multifunctional aldehyde, a multifunctional organic halide, a multifunctional anhydride, a multifunctional azo compound, a multifunctional isothiocyanate or a multifunctional isocyanate whose unreacted amine reactive groups have been reacted with free amine groups of the enzyme to bind it thereto.

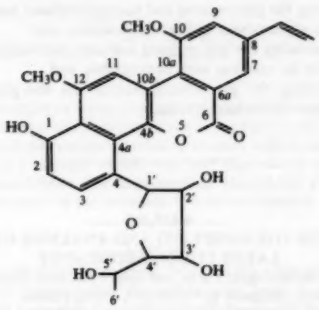
4,438,197

COMPOUND DC-38-V AND PROCESS FOR PRODUCTION THEREOF

Fusao Tomita, Machida; Yuzuru Matsuda, Koganei; Kunikatsu Shirahata; Keiichi Takahashi, both of Machida; Hirofumi Nakano; Tomoyasu Sato, both of Machida; Shuji Okubo, Matsudo, and Nobuo Nakamura, Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 175,324, Aug. 4, 1980, Pat. No. 4,340,725.
This application Apr. 16, 1982, Ser. No. 369,000
Claims priority, application Japan, Aug. 3, 1979, 54-98656
Int. Cl.³ C07G 11/00
U.S. Cl. 435—119 4 Claims

1. A process for producing a compound of the formula



and which is characterized by an infrared absorption spectrum substantially as shown in FIG. 1, an ultraviolet absorption spectrum substantially shown in FIG. 2, a molecular weight of 494 determined by mass spectrometry and a molecular formula of $C_{27}H_{26}O_9$, which comprises culturing a microorganism belonging to the genus Streptomyces which is capable of producing said compound, in a nutrient medium until substantial antibacterial activity is detected in the culture liquor and thereafter recovering said compound therefrom.

4,438,198

BIOCHEMICALLY ACTIVE MATRIX FOR USE IN A BIO-ARTIFICIAL ORGAN

Gottfried Schmer, Seattle, Wash., assignor to Trimedyne, Inc., Arlington Heights, Ill.

Filed Sep. 30, 1981, Ser. No. 307,073
Int. Cl.³ C12N 11/10, 11/02, 11/06; C12M 1/40
U.S. Cl. 435—178 10 Claims

1. A biochemically active matrix suitable for use in a bio-artificial organ comprising at least one biochemically active enzyme covalently bonded to the surface of a carrier matrix of organochemically cross-linked fibrin through a reactive group of the enzyme which is not essential for its enzymatic activity and suspended in a medium of agarose which irreversibly solidifies below 37° C.

4,438,199

MEASURING COMPOSITION

Naoto Miwa, Ibaragi, and Hiroshi Nakajima, Uji, both of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo and Unitika Ltd., Amagasaki, both of, Japan

Filed May 26, 1981, Ser. No. 267,245
Claims priority, application Japan, May 26, 1980, 55-69880
Int. Cl.³ C12N 9/04, 9/10; C12Q 1/32, 1/48
U.S. Cl. 435—190 3 Claims

1. An analytical composition, consisting of:
from 0.1 to 20 μ/ml glucokinase and from 1 to 20 μ/ml glucose-6-phosphate dehydrogenase either one or both of said enzymes being thermostable and being obtained by extraction of a species of thermophilic bacteria.

4,438,200

METHOD FOR THE PREPARATION OF GLUCOSYLRANFERASE

Martin A. Taubman, Newton, and Daniel J. Smith, Natick, both of Mass., assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed Sep. 13, 1982, Ser. No. 416,869
Int. Cl.³ C12N 9/10
U.S. Cl. 435—193 14 Claims

1. A method for preparing glucosyltransferase (GTF) useful for immunization against dental caries, which method comprises:
(a) culturing *Streptococcus mutans* in a medium containing glucose and dialyzable nutrients, to form a mixture of culture cells and supernatant, the supernatant containing GTF;
(b) removing the culture cells and recovering the culture supernatant containing the GTF;
(c) admixing the supernatant containing the GTF with a water-insoluble polyglucan in solid particulate bead form, for a time period sufficient to provide for the binding of the GTF to the polyglucan bead material, to provide a GTF-polysaccharide bead complex;
(d) recovering the GTF water-insoluble bead complex from the supernatant;
(e) washing the GTF water-insoluble polysaccharide complex to remove unbound GTF and medium compounds from the polyglucan bead material;
(f) contacting the GTF water-insoluble polyglucan bead complex with a denaturing solvent, to break the bond between the water-insoluble polyglucan and the GTF, to provide a GTF-denaturing solvent mixture;
(g) recovering the water-insoluble polyglucan bead material; and
(h) concentrating the GTF and purifying the GTF by gel filtration in the denaturing solvent.

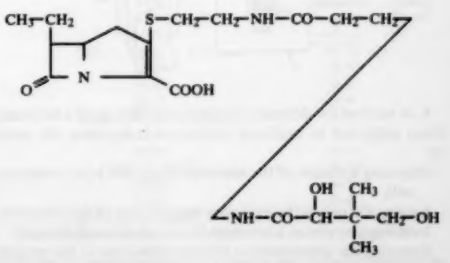
4,438,201

AMIDOHYDROLASE HAVING ABILITY TO DEPANTOTHENYLATE AN ANTIBIOTIC

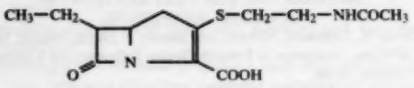
Katsuro Kubo, Fijisawa; Yasuo Fukagawa, Kamakura, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,169
Claims priority, application Japan, Jul. 1, 1981, 56-101161
Int. Cl.³ C12N 9/80; C12P 17/18; C12R 1/465
U.S. Cl. 435—228 4 Claims

1. Amidohydrolase, having the ability to depantothenylate antibiotic OA-6129A represented by the formula



but no substantial ability to deacetylate antibiotic PS-5 represented by the formula



said amidohydrolase being produced by a carbapenem-producing microorganism of the genus Streptomyces.

4,438,202

STABLE, BASE SERUM COMPOSITIONS AND PREPARATION THEREOF

Philip V. Engler, Tarrytown, and Steven N. Buhl, Nyack, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,791
Int. Cl.³ G01N 33/16, 33/48; C09K 3/00
U.S. Cl. 436—8 31 Claims

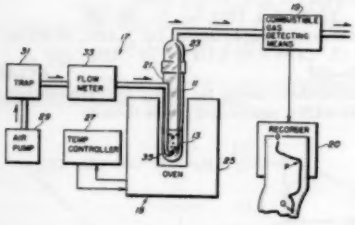
1. A method for preparing a stable, consistent serum having clear optical qualities and improved filterability without significant loss of macromolecular lipid components which comprises the steps of insolubilizing a component or components of said serum by reducing the pH of said serum by an acid addition treatment, separating said insolubilized component or components from the serum and stabilizing the separated serum by raising the pH of said separated serum.

4,438,203

METHOD AND APPARATUS FOR DETERMINATION OF LUBRICANT STABILITY

Henry Wohltjen, Burke, Va.; Paul J. Sniegoski, and Harold Ravner, both of Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 14, 1982, Ser. No. 388,356
Int. Cl.³ G01N 33/30
U.S. Cl. 436—60 10 Claims



6. A method for determining the stable lifetime of a lubricant when subjected to oxidizing conditions comprising the steps of:

disposing a sample of the lubricant under test in an oxidation cell;

heating the cell to the oxidation temperature of the lubricant;

bubbling oxygen at a constant flow rate through the cell;

detecting the concentration of combustible gas in the oxygen flowing out of the cell; and

measuring the time elapsing until the onset of a rapid increase in the concentration of combustible gas.

4,438,204

DETERMINATION OF GLYCOSILATED HEMOGLOBIN

Rolf Deeg, Seeshaupt; Urban Schmitt, Tutzing, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,510
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141146
Int. Cl.³ G01N 33/72, 33/66
U.S. Cl. 436—67 12 Claims

1. A process for the determination of glycosilated hemoglobin in a blood sample containing hemoglobin comprised of both glycosilated and non-glycosilated hemoglobin comprising the steps

liberating the glycosilated and non-glycosilated hemoglobin from erythrocytes in the blood sample, and

differentiating the glycosilated and non-glycosilated hemoglobin by reaction with haptoglobin, and

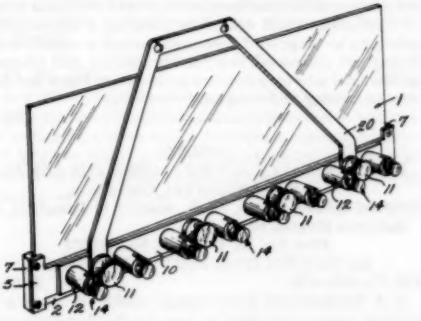
determining the glycosilated and/or the non-glycosilated portion of the hemoglobin.

4,438,205

PROCESS FOR SAMPLING AND ANALYSIS BY THIN LAYER CHROMATOGRAPHY

Didier J. Saint-Leger, Paris, and Andre Abrioux, Drancy, both of France, assignors to "L'Oreal", Paris, France

Filed Jul. 13, 1982, Ser. No. 397,861
Claims priority, application France, Jul. 30, 1981, 81 14816
Int. Cl.³ G01N 31/08, 33/92
U.S. Cl. 436—71 7 Claims



1. A process for sampling and analyzing at least one mixture of substances by thin layer chromatography, said process comprising the steps of:

(a) sampling the said mixture by means of a non-adsorbent solid support;

(b) depositing the thus sampled mixture on a chromatography plate by pressing the said non-adsorbent support, by its face which bears the mixture to be analyzed, directly against an edge zone of the said chromatography plate;

(c) bringing the said edge of the chromatography plate into contact with a solvent or a mixture of solvents, so as to cause the migration of the mixture on the chromatography plate and the separation of the constituents of the said mixture; and

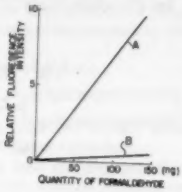
(d) developing the said plate for at least one of the qualitative and quantitative analysis of the constituents of the mixture by keeping the said support pressed against the chromatography plate until the mixture to be analyzed has essentially migrated entirely out of the said support.

4,438,206

METHOD FOR DETERMINATION OF FORMALDEHYDE

Motoo Nakajima, and Kiyoshi Mizusawa, both of Noda, Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Nov. 15, 1982, Ser. No. 441,926
Claims priority, application Japan, Nov. 19, 1981, 56-184492
Int. Cl.³ G01N 21/64, 21/77
U.S. Cl. 436—130 4 Claims



1. In a method of formaldehyde determination by measuring the fluorescence of a fluorescent substance formed by allowing a formaldehyde-containing solution to react with an acetylacetone reagent capable of forming said fluorescent substance from formaldehyde, the improvement comprising measuring the fluorescence in the presence of a serum albumin.

4,438,207

RADIOIMMUNOASSAY FOR CANNABINOIDS

Kenneth E. Fahrenholtz, Bloomfield, and John E. Heveran, Fairfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 79,125, Sep. 26, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 254,022
Int. Cl.³ G01N 33/54; C07G 7/00; C07D 311/78
U.S. Cl. 436—543 15 Claims

5. An immunogen comprising bovine serum albumen and (6aR,10aR)-4-[(6a,7,10,10a-tetrahydro-6,6,9-trimethyl-3-pentyl-6H-dibenzo[b,d]pyran-1-yl)oxy]butanoic acid.

4,438,208

REGION-SPECIFIC DETERMINANTS FOR VITAMIN K DEPENDENT BONE PROTEIN

Leonard J. Deftos, Del Mar, and Bayard D. Catherwood, San Diego, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed May 27, 1982, Ser. No. 382,844
Int. Cl.³ G01N 33/54, 33/56, 33/58; C07C 103/52
U.S. Cl. 436—542 18 Claims

1. An oligopeptide capable of competing with hBGP for an antibody specific for hBGP which comprises:

an amino acid sequence of from 10 to 16 amino acids, wherein terminal sequences of said oligopeptide include the terminal amino acids of hBGP and up to three amino acids can be substituted with different amino acids, except that not more than one amino acid substitution can involve an exchange other than Phe and Tyr or Glu and Gla.

4,438,209

RADIOIMMUNOASSAY FOR FIBRINOPEPTIDE A

Larry D. Mosier, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jul. 17, 1981, Ser. No. 284,152
Int. Cl.³ G01N 33/56, 33/58, 33/60
U.S. Cl. 436—542 11 Claims

1. In a competitive radioimmunoassay method for determining the concentration of fibrinopeptide A in plasma wherein first, a sample of blood is collected, the thrombin in said sample is inhibited by an inhibiting amount of a thrombin inhibitor and plasma is separated from said sample, and second, a sample of said plasma is contacted under radioimmunoassay competitive binding conditions with a sufficient amount of an antibody to fibrinopeptide A and radioactively labelled fibrinopeptide A, thereafter, antibody bound fibrinopeptide A is separated from the unbound fibrinopeptide A and radioactivity measured, the improvement comprising using as the inhibitor for thrombin an inhibitor selected from the group consisting of D-phenylalanyl-L-propyl-L-N-[2(1-chloro-7-guanidoheptane-2-one)] the hydrochloric acid addition salt thereof; the hydroflouric acid addition salt thereof, the acetic acid addition salt thereof and the citric acid addition salt thereof.

4,438,210

TRANSPARENT COLORLESS GLASS-CERAMICS ESPECIALLY SUITABLE FOR USE AS STOVE WINDOWS

Hermann L. Rittler, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,283
Int. Cl.³ C03C 3/22
U.S. Cl. 501—4 1 Claim

1. A transparent, essentially colorless glass-ceramic article containing β-quartz solid solution as the predominant crystal plane having a composition wherein MgO is essentially absent and consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2—65–75,
Li_2O—1–4,
Al_2O_3—15–25,
ZnO—0.5–2,
Na_2O and/or K_2O—0–2,
TiO_2—2–6,
ZrO_2—0–2,
BaO—0–2.5,
F—0–1.2,
Fe_2O_3—>0.01–<0.1.

4,438,211

OPTICAL AND OPHTHALMIC GLASS WITH REFRACTIVE INDICES ND>1.58, ABBE NUMBERS>45 AND DENSITIES<2.75 G/CM³

Karl Mennemann, Taunusstein; Georg Gliemeroth, and Volkmar Geiler, both of Mz. Finthen, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,401
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139212
Int. Cl.³ C03C 3/08
U.S. Cl. 501—65 15 Claims

1. A borosilicate glass composition suitable for use as an eyeglass lens, characterized by having a refractive index nd of about 1.58–1.60, an Abbe number vd>50, a density $\rho \leq 2.75$ g/cm³, and an excellent aptitude for chemical hardening, consisting essentially of the following composition, in weight percent:

SiO_2	51–65
B_2O_3	2–14
Al_2O_3	0–5
$SiO_2 + B_2O_3 + Al_2O_3$	62–73
Li_2O	6–13
Na_2O	0–4
K_2O	0–4
$Li_2O + Na_2O + K_2O$	7–15
CaO	1–19
MgO	0–11
CaO + MgO	6–22
TiO_2	0–8
ZrO_2	0–9.
$TiO_2 + ZrO_2$ being present in an amount sufficient to exhibit said refractive index, Abbe number, and density ranges; and	
ZnO	up to 2.5

2. Glass according to claim 1, having a density of 2.50–2.75

g/cm^3 and being further characterized by the following composition, in weight percent:

SiO_2	58–64
B_2O_3	4–9
Al_2O_3	0–3
$SiO_2 + B_2O_3 + Al_2O_3$	66–73
Li_2O	8–13
Na_2O	0–2
K_2O	0–2
$Li_2O + Na_2O + K_2O$	10–13.5
MgO	0–6
CaO	7–14
MgO + CaO	9–17
TiO_2	1.5–7
ZrO_2	1–6
$TiO_2 + ZrO_2$	4–8.

4,438,212

FLUORINE-FREE CALCIUM-ALUMINOSILICATE GLASSES

William D. Potter, Bishops Stortford; Andrew C. Barclay, Harlow; Reginald Dunning, Parbold near Wigan, and Richard J. Parry, Southport, all of England, assignors to Pilkington Brothers P.L.C., England

Filed Jun. 28, 1982, Ser. No. 392,668

Claims priority, application United Kingdom, Jul. 3, 1981, 8120581

Int. Cl.^{3} C03C *3/04, 12/00*

U.S. Cl. 501—73 **10 Claims**

1. A fluorine-free calciumaluminosilicate glass consisting essentially of 25 to 35% silica, 27 to 35% calcuim oxide, 25 to 40% alumina, 0 to 4% of alkali metal oxide selected from lithium oxide, sodium oxide and potassium oxide, and 0 to 5% of titanium oxide with a total content of lithium, sodium, potassium and titanium oxides of 0.5 to 9%, and with a ratio of calcium oxide to silica of 0.7:1 to 1.0:0.7, said glass being in particulate form in which the individual particles have a particle size of less than 100 microns.

4,438,213

MAGNETIC HEAD SLIDER MATERIAL AND METHOD FOR PRODUCING THE SAME

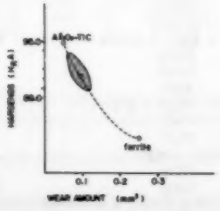
Mitsuhiki Furukawa; Michito Miyahara; Takashi Kitahira; Kiyohito Misumi; Masaharu Shiroyama, all of Fukuoka, and Toshiaki Wada, Osaka, all of Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka and Sumitomo Special Metals Co., Ltd., Osaka, both of, Japan

Filed Aug. 31, 1982, Ser. No. 413,311

Claims priority, application Japan, Aug. 31, 1981, 56-137358

Int. Cl.^{3} C04B *35/56, 35/58*

U.S. Cl. 501—92 **1 Claim**



1. Magnetic head slider material consisting of 5～10 percent by weight of silicon, 1.3～7.8 percent by weight of tungsten silicide and the balance being silicon carbide.

4,438,214

SEMICONDUCTIVE CERAMIC MATERIALS WITH A VOLTAGE-DEPENDENT NONLINEAR RESISTANCE, AND PROCESS FOR PREPARATION

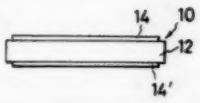
Masaru Masuyama, Harunamachi; Susumu Hirooka, Takasaki, and Nobutatsu Yamaoka, Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1982, Ser. No. 441,219

Claims priority, application Japan, Nov. 26, 1981, 56-189596

Int. Cl.^{3} C04B *35/46*

U.S. Cl. 501—136 **3 Claims**



1. A semiconductive ceramic material with a voltage-dependent nonlinear resistance consisting essentially of 100 mole parts of $Sr_{(1-x)}Ca_xTiO_3$, where x is a numeral from about 0.01 to about 0.50, from about 0.01 to about 3.00 mole parts of at least one metal oxide selected from the group consisting of Nb_2O_5, Ta_2O_5, WO_3, La_2O_3, CeO_2, Nd_2O_3, Y_2O_3, Sm_2O_3, Pr_6O_{11} and Dy_2O_3, and from about 0.02 to about 2.50 mole parts of Na_2O.

4,438,215

ACTIVITY ENHANCEMENT OF HIGH SILICA ZEOLITES

Ralph M. Dessau, Edison, and George T. Kerr, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,175

Int. Cl.^{3} B01J *29/28*

U.S. Cl. 502—71 **8 Claims**

1. A method for enhancing the acid activity of a high silica crystalline zeolite material having a silica-to-alumina mole ratio greater than 100 wherein said crystalline material has been synthesized from a reaction mixture containing tetraalkylammonium ions which comprises calcining said as synthesized crystalline material at a temperature of from about 200° C. to about 600° C. for a period of time ranging from about 1 to about 48 hours, contacting said calcined crystalline material with aluminum chloride vapor at a temperature of from about 100° C. to about 600° C., hydrolyzing said aluminum chloride contacted crystalline material by contacting the same with water and calcining said hydrolyzed crystalline material in order to obtain a crystalline material having an enhanced acid activity.

5. A crystalline zeolite material having enhanced activity prepared by the method of claim **1**, **2**, **3** or **4**.

4,438,216

PROCESS FOR IMPROVED ACTIVATED CARBON HAVING AN ALUMINUM-HEAVY METAL SPINEL

Dennis J. Kampe, Parma, and Srinivasan Sarangapani, Cleveland, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1982, Ser. No. 393,988

Int. Cl.^{3} H01M *4/96, 4/88, 4/04;* **C25B** *11/06*

U.S. Cl. 502—101 **6 Claims**

1. In a method for producing an activated carbon having an aluminum-heavy metal spinel comprising a first heat treatment that activates carbon and/or decomposes the soluble netal salts to their oxides or spinels, the improvement comprises the selection of at least twice the stoichiometric amount of aluminum with respect to the heavy metal for the spinel.

2. The method of claim 1, wherein the amount of aluminum is from two to four times the stoichiometric amount.

4. The method of claim 1, wherein the spinel is $CoAl_2O_4$.

4,438,217

CATALYST FOR OXIDATION OF PROPYLENE

Masahiro Takata; Ryuji Aoki, and Takahisa Sato, all of Himeji, Japan, assignors to Nippin Shokubai Kagako Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 30, 1982, Ser. No. 454,611
Claims priority, application Japan, Jan. 6, 1982, 57-406
Int. Cl.³ B01J 21/08, 23/78, 23/84, 23/88
U.S. Cl. 502—205 3 Claims

1. A catalyst for the oxidation of propylene, said catalyst having the composition represented by the following formula

$$Mo_aW_bBi_cFe_dA_eB_fC_gD_hO_x$$

wherein

A represents at least one element selected from the group consisting of nickel and cobalt,

B represents at least one element selected from the group consisting of alkali metals, alkaline earth metals and thallium,

C represents at least one element selected from the group consisting of phosphorus, arsenic, boron and niobium,

D represents at least one element selected from the group consisting of silicon, aluminum and titanium,

a, b, c, d, e, f, g, h, and x respectively represent the atomic ratios of Mo, W, Bi, Fe, A, B, C, D, and O,

a is from 2 to 12

b is from 0 to 10,

the sum of a and b is 12,

c is from 0.1 to 10.0,

d is from 0.1 to 10.0,

e is from 2 to 20,

f is from 0.005 to 3.0,

g is from 0 to 4,

h is from 0.5 to 15 and

X is a number determined by the atomic valences of the individual elements,

and being molded in the shape of a hollow cylinder having an outside diameter of 3.0 to 10.0 mm, an inside diameter 0.1 to 0.7 times the outside diameter and a length 0.5 to 2.0 times the outside diameter.

4,438,218

CATALYST FOR SULPHUR REMOVAL FROM HYDROCARBONS

Philip M. Boorman; Tristram Chivers; Donald F. Tavares, and Kalabeerappa N. Mahadev, all of Calgary, Canada, assignors to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Filed Jul. 27, 1981, Ser. No. 286,843
Int. Cl.³ B01J 23/04, 27/04
U.S. Cl. 502—220 8 Claims

1. A process for producing a catalyst composition, comprising:

slurrying together, in an aqueous solution, (a) a sulphide of a transition metal selected from the group consisting of iron, vanadium, molydenum, copper and mixtures thereof, (b) a sulphide of an alkali metal selected from the group consisting of sodium and potassium, and (c) a hydroxide of an alkali metal selected from the group consisting of sodium and potassium;

impregnating the slurry onto a catalyst support;

drying the slurry and support at an elevated temperature;

sulphiding the dried mixtures; and

heating the sulphided mixture to remove excess sulphide therefrom.

4,438,219

ALUMINA CATALYST STABLE AT HIGH TEMPERATURES

John T. Brandenburg, Port Neches, Tex., and John M. Crone, Jr., Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,824
Int. Cl.³ B01J 21/02, 21/04, 21/12, 23/10
U.S. Cl. 502—333 22 Claims

1. A method of preparing a catalytic article comprising the steps of contacting a substrate and aluminum metal with an aqueous solution of an alkali hydroxide, and an alkali aluminate for a period of time sufficient to form an adherent film of alumina on said substrate; separating said substrate with said adherent film of alumina from said solution; then heating said substrate and said film of alumina under calcining conditions until said alumina film develops a desired porosity and surface area; and then contacting said calcined alumina film with a material which ameliorates the reduction in surface area and loss of structural integrity of said calcined alumina film during subsequent heating.

4,438,220

POLYURETHANE FOAM-FILLED FOAM RESISTANT TO COMBUSTION AND METHOD OF PRODUCING SAME

Roland N. Fracalossi; Walter V. V. Greenhouse, and Michael S. Buchanan, all of Baltimore, Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 274,726, Jun. 18, 1981, Pat. No. 4,385,131. This application Aug. 18, 1982, Ser. No. 409,030
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ C08G 18/14
U.S. Cl. 521—55 9 Claims

1. A combustion-retardant polyurethane foam structure obtained through the steps of (a) obtaining particles of flexible polyurethane foam; (b) admixing said particles of (a) with solid combustion-retardant material; (c) uniformly applying to said admixture of (b) a liquid flexible polyurethane foam-forming material containing a reactive polyol and a polyisocyanate; (d) foaming said foam-forming material (c) with water to provide a flexible foam having bonded therein said polyurethane foam particles and said solid combustion-retardant material; the relative amounts of materials in said foam structure being such that for each 100 parts by weight of polyurethane foam particles, about 100 to 200 parts by weight of said combustion-retardant material and about 30 to 75 parts by weight of said foam-forming material are used.

4,438,221

POLYURETHANE FOAM-FILLED FOAMS AND METHOD OF PRODUCING SAME

Roland N. Fracalossi; Walter V. V. Greenhouse, and Michael S. Buchanan, all of Baltimore, Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 274,726, Jun. 18, 1981, Pat. No. 4,385,131, and Ser. No. 409,030, Aug. 18, 1982. This application May 23, 1983, Ser. No. 497,034
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ C08G 18/14
U.S. Cl. 521—55 15 Claims

1. A foam-filled polyurethane foam structure obtained through the steps of

(a) obtaining particles of flexible polyurethane foam;

(b) admixing said particles of (a) with a solid material;

(c) uniformly applying to said admixture of (b) a liquid flexible polyurethane foam-forming material containing a reactive polyol and a polyisocyanate;

(d) foaming said foam-forming material of (c) with water to

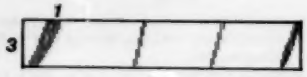
provide a flexible foam having bonded therein said polyurethane foam particles and said solid material;
the relative amounts of materials in said foam structure being such that for each 100 parts by weight of polyurethane foam particles, about 40 to 200 parts by weight of solid material and about 30 to 75 parts by weight of foam-forming material are used, said solid material being inert to said foam and foam-forming material.

4,438,222

HEAT RESISTANT EXPANDABLE PLASTIC PARTICLES AND MOLDED ARTICLES PRODUCED THEREFROM

Masao Nakagawa, Takasago, and Tatehiko Nishida, Ibaraki, both of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 299,201, Sep. 3, 1981, abandoned. This application Jan. 14, 1983, Ser. No. 458,053
Claims priority, application Japan, Sep. 13, 1980, 55-127624
Int. Cl.³ C08J 9/18
U.S. Cl. 521—60 5 Claims



1. A process for producing heat resistant, expandable plastic particles, which comprises subjecting a mixture containing 15–55 weight % of an α-alkylstyrene selected from the group consisting of α-methystyrene, α-ethylstyrene, α-n-propylstyrene and α-iso-propylstyrene and 45–85 weight % of another monomer polymerizable with the α-alkylstyrene, to emulsion polymerization in an aqueous medium in the presence of an emulsifying agent and a radical polymerization catalyst to obtain a polymer latex; separating and drying the polymer latex to obtain a powdery polymer; pelletizing the powdery polymer; and incorporating 3–15 weight % of a volatile blowing agent in the polymer pellets.

4,438,223

BLOWING AGENT COMPOSITION CONTAINING ZINC FORMATE AND METAL SALT ACTIVATOR

Byron A. Hunter, Alpine, Utah, assignor to Uniroyal, Inc., New York, N.Y.

Filed Aug. 22, 1983, Ser. No. 524,945
Int. Cl.³ C08J 9/08
U.S. Cl. 521—92 2 Claims

1. A composition comprising a gas expandable polymer and a blowing agent composition comprising :
(a) zinc formate, and
(b) a compound having the formula M_mX, wherein M is sodium or potassium; X is chlorine, bromine, iodine, CO_3, HCO_3, SO_4, SO_3, S_2O_3, NO_2, SCN, OCN, BO_2, HBO_3, HPO_4, PO_4 or H_2PO_4, and m is an integer representing the valence of X; or a compound having the formula $M_n^1R_p$, wherein M^1 is alkali metal, calcium, lead or zinc, R is organic mono- or polybasic acid having 1-18 carbon atoms and from 0 to 2 nitrogen atoms, or a benzenesulfonyl or toluenesulfonyl radical; and n and p are integers representing the valences of R and M^1, respectively or whole fractions thereof.

4,438,224

METHOD FOR THE PREPARATION OF STYRENE POLYMER FOAM AND FOAM PREPARED THEREBY

Kyung W. Suh, Granville; David C. Krueger, Reynoldsburg, and Burch E. Zehner, Pataskala, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 426,414, Sep. 29, 1982. This application Aug. 15, 1983, Ser. No. 523,216
Int. Cl.³ C08J 9/14
U.S. Cl. 521—146 1 Claim

1. A synthetic resinous thermoplastic foam prepared in accordance with the hereinbefore described method wherein an alkenyl aromatic thermoplastic synthetic resinous elongate foam body having a machine direction and a transverse direction, the body defining a plurality of closed noninterconnecting gas-containing cells therein, the cells having an average cell size of from about 0.1 to 1.2 millimeters, the foam body being of a generally uniform cellular structure and being without discontinuities, the body being without substantial variation in average cell size when cell size is measured by averaging cell diameter across the minimum cross-sectional dimension of the body (i.e., such as by ASTM Method D2842-69), the elongate body having a cross-sectional area of at least 8 square inches and having a minimum cross-sectional dimension of at least 0.25 inch, the foam body having a water vapor permeability not greater than 1.8 perm inches as measured by ASTM Method C355-64 Procedures for Desiccant method, a density of from about 1 to about 5 pounds per cubic foot with the further limitation that the cells contain a blowing agent which has a permeability through the alkenyl aromatic resinous polymer of not greater than 0.017 times the permeability of nitrogen through the body, a C_1 to C_3 monohydric alcohol and the blowing agent having a thermal conductivity of 0.08 British thermal units-inch per hour per square foot per degree Fahrenheit, wherein the foam is prepared by extrusion employing a blowing agent selected from the group consisting of
(1) a mixture of from about 5 to 20 weight percent isopropyl alcohol, from about 5 to 50 percent chlorodifluoromethane, and from about 30 to 70 percent dichlorodifluoromethane;
(2) a mixture of from about 5 to 50 percent of an ethanol, methanol or mixtures thereof, from about 5 to 50 percent of chlorodifluoromethane, and about 30 to 70 percent dichlorodifluoromethane;
and mixtures thereof, all percentages being by weight.

4,438,225

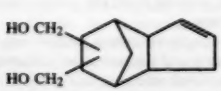
POLYESTER POLYOLS FROM BISHYDROXYMETHYL TRICYCLO COMPOUNDS AND CAPROLACTONE AND POLYURETHANES BASED THEREON

Dwight Peerman, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 12, 1983, Ser. No. 484,320
Int. Cl.³ C08G 18/14, 18/32; C07C 69/66
U.S. Cl. 521—172 15 Claims

1. Polyester polyols formed by the reaction of a bishydroxymethyl tricyclo compound of the formulae:

and



and alkoxylated derivatives thereof with a caprolactone in a

molar ratio of bishydroxymethyl tricyclo compound to caprolactone between about 1:1 and 1:20.

7. Urethane linked reaction products derived from at least one polyester polyol of claim 1 and at least one polyisocyanate.

4,438,226

POLYURETHANES DERIVED FROM 1,4-LACTONES OF 3,6-ANHYDRO-2,3,4,5,6-PENTAHYDROXYHEXANOIC ACID

Stoil K. Dirlikov, and Connie J. Schneider, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

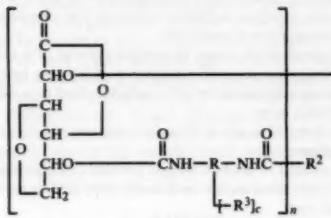
Filed Apr. 22, 1983, Ser. No. 487,475
Int. Cl.³ C08G *18/14, 18/32, 18/64*
U.S. Cl. 521—175 **17 Claims**

1. A polyurethane comprising the reaction product of

(a) a 1,4-lactone of 3,6-anhydropentahydroxyhexanoic acid; and

(b) an organic polyisocyanate.

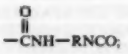
7. A polyurethane which corresponds to the formula,



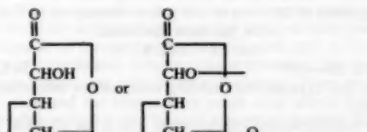
wherein

R is a 2+c valent hydrocarbyl radical;

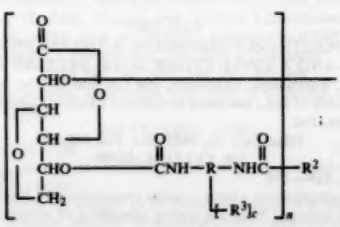
R^1 is H or



R^2 is



R^3 is separately in each occurrence —N=C=O or



c is between about 0 and 8; and

n is between about 1 and 50,000.

4,438,227

COMPOSITION AND METHOD OF MASKING

James B. Nall, San Diego, and Jeffery J. King, Orange, both of Calif., assignors to Ronald Jay Brahams, San Diego, Calif.

Filed Oct. 4, 1982, Ser. No. 432,451
Int. Cl.³ C08L *1/18;* **B05D** *1/32, 5/00*
U.S. Cl. 524—33 **16 Claims**

1. In the manufacture of an electrical or electronic component which includes the application of a varnish or other insulating and sealing compound to the surface of said component by either dipping, brushing or spraying method, a process, for preventing the adhesion of said compound to certain areas of said component and for conditioning them for good electrical contact, which comprises:

prior to said application, contacting said areas with a masking hydrophobic mixture comprising essentially:

a volatile organic solvent sufficient to solvate the mixture;

nitrocellulose;

a formaldehyde based resin, and

a phosphate fire retardant;

applying said compound to said surface;

curing said compound and carbonizing said mixture by heating said component to at least 93° C.; and

brushing away said carbonized mixture and overlying compound from said areas.

4,438,228

FILLED AND PLASTICIZED BLENDS OF LINEAR LOW DENSITY POLYETHYLENE

Timothy T. Schenck, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 176,783, Aug. 11, 1980, abandoned. This application Jun. 15, 1981, Ser. No. 273,418
Int. Cl.³ B32B *27/30;* **C08L** *23/08, 23/16*
U.S. Cl. 524—109 **76 Claims**

1. A composition consisting essentially of (a) from about 5 to about 55% by weight of at least one copolymer of ethylene with at least one α-olefin comonomer said comonomer containing from 4 to 10 carbon atoms, the ethylene content of said copolymer being from about 75 to about 98% by weight, the comonomer content of said copolymer being from about 2 to about 25% by weight, and the melt index of said copolymer being from about 0.1 to about 150; (b) from about 2 to about 12% by weight of at least one plasticizer selected from the group consisting of processing oils, epoxidized oils, polyesters, polyethers and polyether esters; and (c) from about 40 to about 90% by weight of filler.

4,438,229

THERMOPLASTIC COMPOSITION

Yoshitagu Fujimori, Tokorozawa; Yasuo Takabori, Shiki; Hajime Sakano, Hirakata, and Akitoshi Ito, Nabari, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka and Honda Motor Co., Ltd., Tokyo, both of, Japan

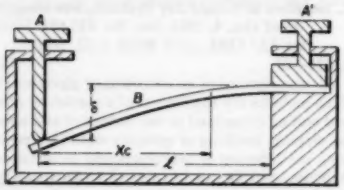
Filed Sep. 8, 1982, Ser. No. 415,870
Claims priority, application Japan, Sep. 9, 1981, 56-143076; Nov. 12, 1981, 56-182127
Int. Cl.³ C08L *69/00*
U.S. Cl. 524—109 **7 Claims**

1. A thermoplastic composition having improved weld strength which comprises a blend essentially consisting of:

(A) 20 to 80% by weight based on the weight of A and B of a thermoplastic polycarbonate resin;

(B) 80 to 20% by weight based on the weight of A and B of a graft polymer obtained by grafting at least one aromatic vinyl compound and at least one member of the group consisting of vinyl cyanides and alkyl unsaturated carboxylates onto a conjugated diene rubber or a mixture of a conjugated diene rubber with a copolymer of at least one

aromatic vinyl compound and at least one member of the group consisting of vinyl cyanides and alkyl unsaturated carboxylates, the copolymer being present in an amount of not more than 90% by weight on the basis of the combined amount of the graft polymer and the copolymer; and



(C) a polyolefin or a plasticizer having a light transmission of not less than 70% when determined on a 20 micron film prepared from a solution of the plasticizer (0.25 g) and acrylonitrile-styrene copolymer (weight ratio of acrylonitrile and styrene, 30:70; 0.75 g) in acetone (10 ml), the weight proportion of the blend, (A)+(B), and the polyolefin or the plasticizer (C) being 100:0.2–20.

4,438,230

CARBOXYLATED NITRILE RUBBER/PVC/NYLON FLUX BLENDS

Herbert F. Schwarz, Sarnia, Canada, assignor to Polysar Limited, Ontario, Canada

Filed Nov. 29, 1982, Ser. No. 444,975

Int. Cl.³ C08K *5/37;* **C08L** *27/06, 33/18, 77/00*

U.S. Cl. 524—151 **21 Claims**

1. A vulcanizable polymer composition comprising a polymer blend and a curative system, said polymer blend being a flux blend of (i) from about 5 to about 50 parts by weight of polyvinyl chloride, (ii) from about 35 to about 75 parts by weight of a carboxylated nitrile rubber, (iii) from about 5 to about 50 parts by weight of a nylon having a melting point of less than about 210° C., the total of (i), (ii) and (iii) being 100 parts by weight, (iv) from about 1.5 to about 4 parts by total weight of one or more stabilizers for (i), and (v) from about 0.25 to about 3 parts by total weight of one or more antioxidants for (ii), said parts of (iv) and (v) being per 100 parts total of (i), (ii) and (iii).

4,438,231

HIGH IMPACT STRENGTH, FLAME RETARDANT POLYCARBONATE COMPOSITION

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jan. 29, 1982, Ser. No. 343,948

Int. Cl.³ C08K *5/42;* **C08L** *51/06, 69/00*

U.S. Cl. 524—161 **11 Claims**

1. A flame retardant molding composition which comprises:

(a) from about 70 to 85 parts by weight of a high molecular weight polycarbonate resin;

(b) from about 10 to 30 parts by weight of a copolycarbonate of tetrabromobisphenol-A and bisphenol-A;

(c) from about 1 to 5 parts by weight of a multiphase composite interpolymer comprising an acrylate and a methacrylate;

(d) from about 0.5 to 5 parts by weight of a copolymer of a C_{2-5} olefin and a C_{1-5} acrylate;

and

(e) an effective amount of a flame retardant alkali metal salt.

4,438,232

CARBOXYLATED ACRYLATE STYRENE BUTADIENE ADHESIVES

Ivan S. Lee, Brights Grove, Canada, assignor to Polysar Limited, Ontario, Canada

Filed Aug. 10, 1982, Ser. No. 406,888

Int. Cl.³ C08L *93/00, 9/08*

U.S. Cl. 524—272 **15 Claims**

1. A pressure sensitive adhesive composition comprising the latex of a polymer formed by polymerizing:

(a) from about 40 to about 10 weight percent of a vinyl or vinylidene monoaromatic monomer which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atom;

(b) from about 45 to about 70 weight percent of a C_{4-6} conjugated diene;

(c) from about 1 to about 5 weight percent of a C_{3-6} ethylenically unsaturated mono- or di-carboxylic acid or a mixture thereof; and

(d) from about 5 to about 30 weight percent of a C_{1-8} alkyl ester of acrylic or methacrylic acid; wherein the total of (a), (b), (c) and (d) is 100 weight percent.

13. A substrate coated with from about 15 to about 60 g/m^2 of a pressure sensitive adhesive composition comprising a polymer formed by polymerizing:

(a) from about 40 to about 10 weight percent of a vinyl or vinylidene monoaromatic monomer which may be unsubstituted or substituted by a C_{1-4} alkyl radical or a chlorine or bromine atom;

(b) from about 45 to about 70 weight percent of a C_{4-6} conjugated diene;

(c) from about 1 to about 5 weight percent of a C_{3-6} ethylenically unsaturated mono- or di-carboxylic acid or a mixture thereof; and

(d) from about 5 to about 30 weight percent of a C_{1-8} alkyl ester of acrylic or methacrylic acid; wherein the total of (a), (b), (c) and (d) is 100 weight percent.

4,438,233

FAST CRYSTALLIZING POLYALKYLENETEREPHTHALATE RESIN COMPOSITIONS

Chung J. Lee, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

Filed Sep. 20, 1982, Ser. No. 420,570

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.³ C08L *67/02*

U.S. Cl. 524—299 **16 Claims**

1. A fast crystallizing molding composition comprising essentially:

a. a polyalkyleneterephthalate in which the alkylene group has 2–4 carbon atoms;

b. a complex of LiX and a polymeric compound having at least two recurring units having the formula $—CH_2C-H_2O—$, the amount of said complex being enough to give a proportion of 0.05–4 percent by weight of LiX based on the weight of said polyalkyleneterephthalate, wherein X is Br, Cl or I.

4,438,234

COMPOSITIONS COMPRISING A THERMOPLASTIC RESIN AND A VINYL ETHER MOLD RELEASE AGENT

Niles R. Rosenquist, Evansville, and Garland G. Lee, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 15, 1982, Ser. No. 449,983

Int. Cl.³ C08L *69/00*

U.S. Cl. 524—378 **18 Claims**

1. A composition which consists essentially of a thermoplastic resin selected from the group consisting of aromatic polycarbonates, polyesters, polysulfones, polyethersulfones, poly-

amides, polysulfides, polyacrylates, polyurethanes, polyolefins, polyvinylhalides, acrylonitrile butadiene styrenes, butadiene styrenes and methacrylate butadiene styrenes and a mold release effective amount of a vinyl ether of the formula

$$R—O—CH_2=CH_2$$

wherein R is alkyl of about 14 to about 36 carbon atoms, inclusive.

4,438,235

TERTIARY ALKANOLAMINES TO INCREASE VISCOSITY OF FILLED LIQUID POLYMERS

Bernardas Brizgys, Southgate, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 30, 1982, Ser. No. 430,153

Int. Cl.³ C08L *75/08*

U.S. Cl. 524—700 **12 Claims**

1. A filled liquid polymer composition comprising a liquid polymer having a molecular weight of about 100 to about 2000 and containing at least two active hydrogen atoms as determined by the Zerewitinoff Method, an inorganic filler, selected from the group consisting of calcium carbonate, hydrated aluminum silicate, hydrated magnesium silicate and titanium dioxide, said inorganic filler present in the amount of about 5 percent by weight to about 50 percent by weight, based on the weight of said liquid polymer and a tertiary alkanolamine having in each chain 2 to about 8 carbon atoms, wherein said tertiary alkanolamine is selected from the group consisting of alkyl dialkanolamine, dialkyl alkanolamine and trialkanolamine, said tertiary amine present in the amount of 0.1 percent to about 2 percent by weight based on the weight of said inorganic filler.

4,438,236

COMPOSITIONS OF MELT-PROCESSABLE POLYMERS HAVING IMPROVED PROCESSABILITY

Frederic N. Cogswell, Welwyn Garden City; Brian P. Griffin, St Albans, and John B. Rose, Letchworth, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 207,708, Nov. 17, 1980, Pat. No. 4,386,174. This application Jun. 14, 1982, Ser. No. 388,462

Claims priority, application United Kingdom, Nov. 30, 1979, 7941364; Nov. 30, 1979, 7941365

Int. Cl.³ C08L *1/08;* **C08G** *18/00, 59/19, 83/00*

U.S. Cl. 525—165 **10 Claims**

1. A melt-processable polymer composition comprising from 0.5 to 5.0% by weight of the composition of at least one polymer capable of forming an anisotropic melt and at least one other melt-processable polymer characterised in that the temperature range over which the polymer can form an anisotropic melt and the temperature range over which the melt-processable polymer may be melt processed overlap, with the proviso that the other melt-processable polymer may not become melt processable until blended with the anisotropic-melt-forming polymer.

4,438,237

THERMOPLASTIC MOLDING MASSES OF STYRENE-ACRYLONITRILE AND POLYAMIDE

Franz Brandstetter, Neustadt; Juergen Hambrecht, Heidelberg; Rudolf H. Jung, Worms, and Gerhard Lindenschmidt, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 10, 1982, Ser. No. 347,648

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105653

Int. Cl.³ C08L *77/00*

U.S. Cl. 525—183 **6 Claims**

1. A thermoplastic molding mass comprising, based on a 100 parts of (a)+(b):

(a) 95 parts by weight to 99 parts by weight of a copolymer of styrene and/or α-methylstyrene with acrylonitrile wherein the copolymers contain 25 percent by weight to 35 percent by weight of acrylonitrile in polymerized form,

(b) 1 part by weight to 5 parts by weight of a polyamide made from

(1) 8 percent by weight to 13 percent by weight of adipic acid/hexamethylene diamine salts and

(2) 92 percent by weight to 87 percent by weight of a salt of piperazine and a mixture of decane dicarboxylic acids and azelaic acids in a mole ratio of 80:20 to 92:8.

4,438,238

LOW DENSITY COPOLYMER COMPOSITION OF TWO ETHYLENE-α-OLEFIN COPOLYMERS

Nobuo Fukushima, Ootsu; Shuji Kitamura, Ibaraki; Kiyohiko Nakae, Nishinomiya; Tadatoshi Ogawa, Takatsuki; Kozo Kotani, and Hidekazu Hosono, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 25, 1982, Ser. No. 342,428

Claims priority, application Japan, Jan. 30, 1981, 56-14038; Jan. 30, 1981, 56-14039; Jan. 30, 1981, 56-14040; Jan. 30, 1981, 56-14041; Jan. 30, 1981, 56-14042; Jan. 30, 1981, 56-14043; Jan. 30, 1981, 56-14044

Int. Cl.³ C08F *297/08;* **C08L** *23/06, 23/08*

U.S. Cl. 525—240 **23 Claims**

1. An ethylene-α-olefin copolymer composition excellent in transparency and strength and having a density of 0.915 to 0.929 g/cm^3, a melt index of 0.02 to 50 g/10 min. and a melt flow ratio of 35 to 250, which comprises 10 to 70% by weight of an ethylene-α-olefin copolymer A and 90 to 30% by weight of an ethylene-α-olefin copolymer B; said copolymer A having a higher molecular weight than copolymer B and being a copolymer of ethylene and an α-olefin of 3 to 18 carbon atoms and having a density of 0.895 to 0.935 g/cm^3, an intrinsic viscosity of 1.2 to 6.0 dl/g, the number of short chain branching per 1000 carbon atoms (hereinafter abbreviated as "S.C.B.") of 7 to 40 and a (weight average molecular weight)/(number average molecular weight) value of 2 to 10; said copolymer B being a copolymer of ethylene and an α-olefin of 3 to 18 carbon atoms and having a density of 0.910 to 0.955 g/cm^3, an intrinsic viscosity of 0.3 to 1.5 dl/g, S.C.B. of 5 to 35 and a (weight average molecular weight)/(number average molecular weight) value of 2 to 10; said copolymer A and said copolymer B being selected in order to satisfy a condition that (S.C.B. of said copolymer A)/(S.C.B. of said copolymer B) is 0.6 to 1.7.

14. A composition of copolymers of ethylene and an α-olefin of 3 to 18 carbon atoms, having first and second component groups, said first component group having a higher molecular weight than said second component group, having the following properties:

(1) density of 0.915 to 0.929 g/cm^3,

(2) intrinsic viscosity [η] of 0.7 to 4.0 dl/g,

(3) melt index of 0.02 to 50 g/10 min.,

(4) S.C.B. being 5 to 45,

(5) $[\eta]/[\eta]_l$ namely g_η^* being at least 0.8, where $[\eta]_l$ is an intrinsic viscosity of a linear polyethylene having the same weight average molecular weight measured by a light scattering method,

(6) (S.C.B. of the first component group)/(S.C.B. of the second component group) being 0.6 to 0.8 where the two component groups are prepared by consolidating fractions obtained by column fractionation in two portions of lower and higher molecular weight components, said portions being selected so that the weight ratio of the two portions corresponds to the weight ratio of lower and higher molecular weight components calculated from the gel permeation chromotography curve,

(7) the second components have a density of 0.910 to 0.955 g/cm^3, an intrinsic viscosity of 0.3 to 1.5 dl/g and S.C.B. of 5 to 35,

(8) the first components have a density of 0.895 to 0.935

g/cm^3, an intrinsic viscosity of 1.2 to 6.0 dl/g and S.C.B. of 7 to 40, and

(9) the second components are 30 to 90% by weight and the first components are 70 to 10% by weight.

4,438,239

MICROSPHERE COATED SUBSTRATE CONTAINING REACTIVE ALDEHYDE GROUPS

Alan Rembaum, Pasadena, and Richard C. K. Yen, Glendale, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 30, 1981, Ser. No. 248,898

Int. Cl.^{3} **C07G** *7/00;* **C12N** *11/08;* **B05D** *3/06;* **C08F** *16/34*

U.S. Cl. 525—54.1 **9 Claims**

1. A coated article comprising:

a synthetic organic resin substrate, said resin being capable of developing covalent bonds during high energy radiation;

a continuous layer of contiguous, tangential, individual microspheres having an uniform diameter between 100 Angstroms and 2000 Angstroms bound to the surface of the substrate by covalent bonds formed between the resin and the microspheres by means of high energy radiation grafting of the microspheres to the surface of the resin substrate, said microspheres consisting essentially of the addition polymerized polymer of an unsaturated aldehyde containing 4 to 20 carbon atoms.

8. A composition comprising an adduct of the article of claim 1 with a material selected from aldehyde reactive proteins, pharmaceuticals and fluorescent chromophores.

4,438,240

POLYAMIDE ELASTOMER

Chiaki Tanaka, Chita; Shinobu Nakashima, Nagoya, and Makoto Kondow, Konan, all of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Filed May 25, 1983, Ser. No. 497,864

Claims priority, application Japan, May 27, 1982, 57-90212

Int. Cl.^{3} **C08F** *283/04;* **C08G** *69/48;* **C08L** *77/00*

U.S. Cl. 525—420 **20 Claims**

1. A polyether-ester-amide consisting essentially of about 5 to 50 weight percent of polyamide segment (A) and about 95 to 50 weight percent of polyether ester segment (B), and having a melting point not lower than 160° C., a Shore hardness in the range of 80A to 45D, a tensile modulus in the range of 100 to 1,000 kg/cm^2 and an elastic recovery at 50% elongation of not less than 70%,

said polyamide segment (A) having been obtained from:

a C_6–C_{20} aliphatic diamine (A-1): and

at least one dicarboxylic acid (A-2) selected from the group consisting of C_6–C_{15} aliphatic dicarboxylic acids, terephthalic acid and hexahydroterephthalic acid, provided the total number of carbon atoms of said diamine and said dicarboxylic acid is not less than 16,

said polyether ester segment (B) having been obtained from:

a poly(alkylene oxide) glycol (B-1) having a ratio of carbon atom number to oxygen atom number of not smaller than 2.3 and having a number average molecular weight in the range of 300 to 5,000; and

a C_4–C_{20} dicarboxylic acid (B-2).

4,438,241

HEAT RESISTANT POLYARYLATES

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1982, Ser. No. 453,106

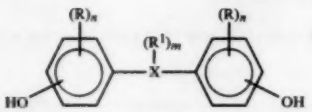
Int. Cl.^{3} **C08G** *63/18, 63/66, 63/68*

U.S. Cl. 525—444 **32 Claims**

1. Polyarylate compositions exhibiting improved heat resistance comprised of (i) at least one polyarylate prepared by reacting:

(a) at least one aromatic dicarboxylic acid or a reactive derivative thereof; and

(b) at least one dihydric phenol represented by the general formula



wherein:

R is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals;

R^1 is independently selected from monovalent hydrocarbon radicals;

X is selected from cycloalkylidene radicals containing from at least 8 to about 16 ring carbon atoms;

n is independently selected from whole numbers having a value of from 0 to 4 inclusive; and

m represents a whole number having a value of from 0 up to the number of replaceable hydrogen atoms present on X.

4,438,242

RETARDATION OF POLYMER BUILDUP IN MONOVINYL AROMATIC SUSPENSION POLYMERIZATION USING SULFUR TRIOXIDE AS REACTOR COATING

William J. Settineri, and John M. Hensler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 7, 1982, Ser. No. 366,264

Int. Cl.^{3} **C08J** *9/26, 9/28*

U.S. Cl. 526—62 **7 Claims**

1. In suspension polymerization of monovinyl aromatic-polymers in a reactor wherein polymer buildup occurs on the internal surfaces of the reactor, the improvement which comprises contacting the internal surfaces of the reactor with at least about 0.01 gram of sulfur trioxide per gallon of reactor volume prior to said suspension polymerization, whereby further polymer buildup is retarded.

4,438,243

PROCESS FOR PRODUCING RANDOM ETHYLENE TERPOLYMER

Norio Kashiwa; Yoshinori Morita, and Michiharu Suga, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 85,584, Oct. 17, 1979, abandoned. This application May 14, 1981, Ser. No. 263,721

Claims priority, application Japan, Oct. 18, 1978, 53-127305

Int. Cl.^{3} **C08F** *2/06, 10/02*

U.S. Cl. 526—125 **10 Claims**

1. A process for producing a random terpolymer of ethylene and alpha-olefins having at least 3 carbon atoms in the presence of a catalyst composed of (1) a titanium catalyst component having a surface area of at least 20 m^2/g and comprising from 0.5 to 10 parts by weight of titanium, 15 to 30 parts by weight of magnesium, 50 to 70 parts by weight of halogen and, optionally, about 0.1 to 50 parts by weight of an electron donor; said titanium catalyst component having a halogen/titanium weight ratio of from 3 to 200, and a magnesium/titanium mole ratio of from 3 to 90 and a surface area of at least 20 m^2/g and (2) an organoaluminum catalyst component in a hydrocarbon solvent at a temperature above the melting point of the terpolymer formed, under such conditions that the resulting copolymer dissolves in the hydrocarbon solvent; characterized in that said terpolymer consists essentially of

(A) 92 mole% to 99 mole% of ethylene,

(B) 0.3 mole% to 7 mole% of an alpha-olefin with 3 or 4 carbon atoms, and

(C) 0.3 mole% to 7 mole% of an alpha-olefin with 6 to 12 carbon atoms, the total of the proportions of the monomers (A), (B), and (C) being 100 mole%.

4,438,244

PROCESS FOR THE PRODUCTION OF POLYMERS AND COPOLYMERS OF VINYL CHLORIDE

Gilbert Sielfeld, and Paul Sunder-Plassmann, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,608

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120358

The portion of the term of this patent subsequent to Sep. 11, 2000, has been disclaimed.

Int. Cl.[3] **C08F** *2/20, 14/06*

U.S. Cl. 526—202 **11 Claims**

1. In a process for preparing a polymer or copolymer of vinyl chloride by suspension polymerization using a suspension stabilizer and a monomer-soluble free radical catalyst, the improvement wherein the suspension stabilizer is 0.1–0.5% by weight, based on the amount of monomer, of a copolymer of 65–85 molar percent of 2-isopropyl-Δ^2-oxazoline and 35–15 molar percent of 2-methyl-Δ^2-oxazoline, having a viscosity number of 35–80 ml/g, measured at 25° C. in an isopropanol/-water mixture (50 volume percent of isopropanol) in a concentration of 0.5% (weight/volume of solution).

4,438,245

POLYMERS CONTAINING AROMATIC SULFONIC ACID ESTER OR AMIDE GROUPS

Masato Satomura, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

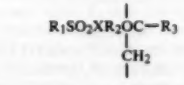
Filed Oct. 16, 1973, Ser. No. 407,034

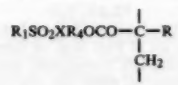
Claims priority, application Japan, Oct. 18, 1972, 47-103550

Int. Cl.[3] **C08F** *12/30, 16/30, 20/50, 28/04*

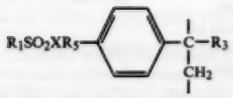
U.S. Cl. 526—286 **19 Claims**

1. A functional group containing homopolymer or copolymer having aromatic sulfonic acid ester or amido groups, said homopolymer or copolymer containing therein monomer units of the general formula



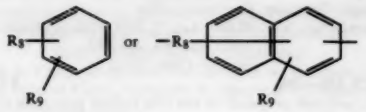


or

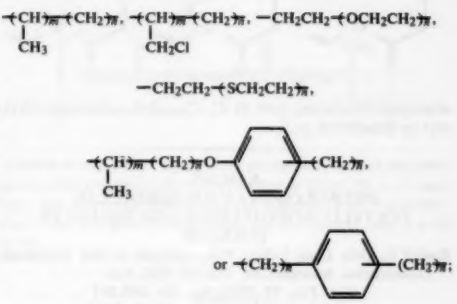


wherein

R_1 is

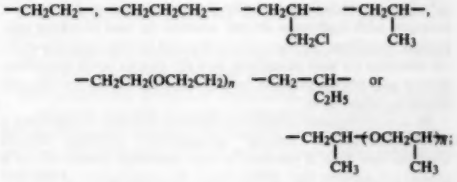


R_2 is



R_3 is a hydrogen atom or a methyl group;

R_4 is



R_5 is $—(CH_2)_m—$;

m is 0 or 1;

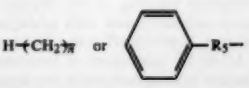
n is 1, 2, 3 or 4;

x is —O—, —S—, —NH— or $—NR_{10}—$;

R_8 is a hydrogen atom, a chlorine atom, a bromine atom, a fluorine atom $H—(CH_2)_n$ $H—(CH_2)_nO—$, a nitro group, a sulfo group or a carboxy group; and

R_9 is a hydrogen atom, a bromine atom, a fluorine atom, a chlorine atom, $H—(CH_2)_n$, $H—(CH_2)_nO—$, a nitro group, a sulfo group, a carboxy group, a cyano group, a phenyl group, an acetyl group, a phenoxy group, or a benzoyl group; and

R_{10} is



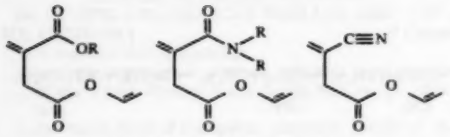
and in the case of said copolymer, polymerized units of unsaturated comonomer copolymerizable with said monomer.

4,438,246
4-VINYL-2-METHYLENE BUTANEDIOIC ACID COMPOUNDS

Rodney D. Bush, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 290,907, Aug. 7, 1981. This application May 27, 1983, Ser. No. 499,052
Int. Cl.³ C08F *20/42*
U.S. Cl. 526—298 **5 Claims**

4. A polymer prepared by the free radical polymerization of a compound selected from the group consisting of



wherein R is selected from H, C_1–C_{18} alkyl, substituted alkyl, aryl or substituted aryl.

4,438,247
PREPARATION OF REGIOREGULAR POLYFLUOROETHYLENES AND PRODUCTS THEREOF

Rudolf E. Cais, Long Valley, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 19, 1982, Ser. No. 350,297
Int. Cl.³ C08F *8/00, 8/26, 14/18, 14/22*
U.S. Cl. 526—249 **18 Claims**

1. A process useful for forming regioregular polymers comprising the steps of (1) polymerizing by a free-radical reaction, a fluoroethylene monomer having a chemically bonded blocking substituent comprising at least one blocking group to produce a precursor polymer and (2) replacing said blocking substituent which is chemically incorporated in said precursor polymer with hydrogen atoms, wherein (a) said blocking substituent stabilizes the free-radical formed during said free-radical reaction on said monomer, and (b) blocks bond formation during said polymerization between carbon atoms having said blocking substituent.

15. A regioregular polyfluoroethylene polymer comprising a polyfluoroethylene having asymmetric building blocks wherein less than 3 percent of said building blocks are in a spatial orientation that differs from the orientation of the majority of said building blocks comprising said polyfluoroethylene wherein the substituents on said polyfluoroethylene consist essentially of atoms chosen from the group consisting of hydrogen and fluorine.

4,438,248
TRIMERIZATION CATALYSTS AND ORGANO-MERCURY COMPOUNDS AS CO-CATALYSTS FOR THE PREPARATION OF NONCELLULAR POLYURETHANE ELASTOMERS

Donald L. Christman, Grosse Ile, and Bernard A. Merkl, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 20, 1982, Ser. No. 451,080
Int. Cl.³ C08G *18/22*
U.S. Cl. 528—57 **6 Claims**

1. A process for preparing a noncellular polyurethane elastomer which comprises reacting, in the absence of a blowing agent, an organic polyisocyanate with an organic compound having at least two Zerewitinoff active hydrogen atoms in a ratio of from 1.0 to 1.2 equivalents of isocyanate groups per equivalent of active hydrogen atoms in the presence of a catalytically effective amount of a co-catalyst composition comprising an organo-mercuric compound and an alkali metal carboxylic acid salt in a weight ratio of from 1 to 5 parts organo-mercuric compound per part of alkali metal carboxylic acid salt.

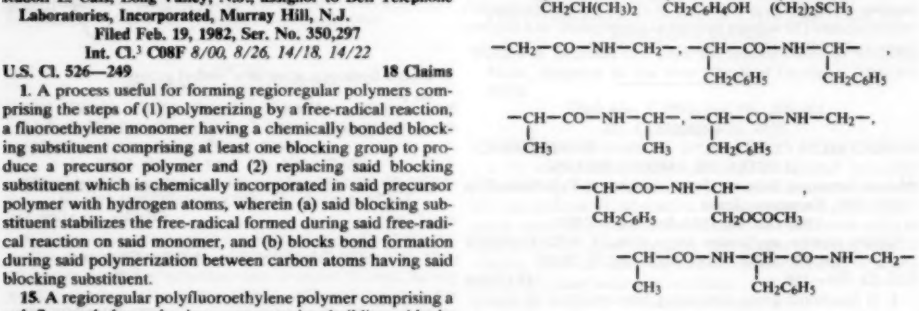
4,438,249
BIODEGRADABLE POLYURETHANE UREA ACYL SEMICARBAZIDES FOR THE MANUFACTURE OF BIODEGRADABLE ALLOIMPLANTS

Tatyana E. Lipatova, ulitsa Rozy Ljuxemburg, 15. kv. 14; Dmitry V. Vasiichenko, ulitsa Serafimovicha, 7. kv. 26; Georgy A. Pkhakadze, ulitsa Vladimirskaya, 48a. kv. 16, and Xenya L. Konoplitskaya, ulitsa Florentsii 10ª kv. 102, all of Kiev, U.S.S.R.

Continuation of Ser. No. 252,552, Apr. 9, 1981, abandoned. This application Mar. 26, 1982, Ser. No. 362,429
Int. Cl.³ C08G *18/10, 18/38*
U.S. Cl. 528—61 **2 Claims**

1. Polyurethane urea acyl semicarbazides for preparing biodegradable alloimplants having the general formula: (—N-H—R_1—CONHNHCONH—R_2—NHCO—O—R_3—CON-H—R_2—NH—CO—)$_n$

R_1 is selected from the group consisting of



wherein n is from 5 to 24 R_2 is selected from the group consisting of —$(CH_2)_6$—, —C_6H_4—CH_2—C_6H_4;

R_3 is selected from the group consisting of —$(CH_2)_4$—O—$_{14}$, —$(CH_2)_4$—O—$_{21}$.

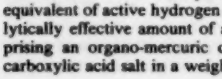
4,438,250
SUSPENSIONS OF ISOCYANATO UREAS IN ISOCYANATE PREPOLYMERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE IN THE PRODUCTION OF HIGH MOLECULAR-WEIGHT POLYURETHANE PLASTICS

Gerhard Grögler; Otto Ganster, both of Leverkusen, and Klaus Recker, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,481
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902469
Int. Cl.³ C08G *18/38*
U.S. Cl. 528—66 **3 Claims**

1. A suspension of

(a) an isocyanato urea corresponding to the following general formula:



wherein

R represents a difunctional aromatic radical obtained by removing the isocyanate groups from an aromatic diisocyanate and

m represents 0 or an integer of 1 to 5,

in

(b) an isocyanate prepolymer corresponding to the following general formula:

$$D—O—CO—NH—A—NCO)_n$$

wherein

A represents a radical obtained by removing the isocyanate groups from an organic diisocyanate,

D represents a radical obtained by removing the hydroxyl groups from an n-functional polyhydroxyl compound having a molecular weight of from 500 to 8000, and

n represents an integer from 2 to 4, said suspension being liquid at room temperature or being liquefiable by heating to at most 80° C.

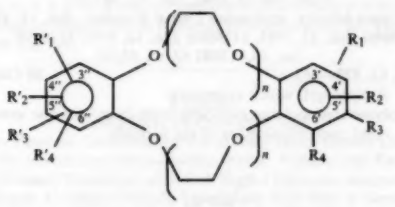
4,438,251
POLYURETHANE POLYMERS COMPRISING MACROCYCLIC CROWN ETHERS IN THE POLYMER BACKBONE

John E. Herweh, East Hempfield Township, Lancaster County, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed May 16, 1983, Ser. No. 494,975
Int. Cl.³ C08G 18/32
U.S. Cl. 528—73 **16 Claims**

1. Polyurethane polymers comprising macrocyclic polyether moieties in the polymer backbone, said polymers being obtained from the reaction of

(a) a crown ether of the structure



where n=1-3; R_1=—CHOHR$_5$, R_2, R_3, and R_4 independently=H or CH_3, and R_5=H or a straight or branched chain alkyl group having from 1-13 carbon atoms; provided that when R_1 is in the 3'-position, R_1' is in the 3''- or 6''-position, and when R_1 is in the 4-position, R_1' is in the 4''- or 5''-position, and further provided that the ring positions of R_2', R_3', and R_4' in relation to R_1' are the same as those of R_2, R_3 and R_4 in relation to R_1; and

(b) a suitable diisocyanate.

4,438,252
POLYMER-MODIFIED POLYOLS

William G. Carroll, Lancashire; Peter Farley, Manchester, and Raymond J. Marklow, Cheshire, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 16, 1982, Ser. No. 398,885
Claims priority, application United Kingdom, Aug. 8, 1981, 8124506; Mar. 29, 1982, 8209218
Int. Cl.³ C08G 18/38, 18/48, 18/52
U.S. Cl. 528—75 **9 Claims**

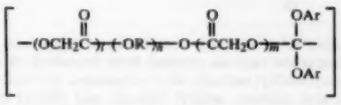
1. A polymer-modified polyol comprising a dispersion in a first polyol which has a molecular weight of at least 1000, an average functionality of more than 2, and a Hydroxyl Number of less than 150, of the reaction product of a polyisocyanate and a second polyol which is either (a) a polyethylene glycol having a molecular weight of up to 600 or (b) a polyol, which is not a polyethylene glycol, and which has a molecular weight of less than 250 and is free from nitrogen atoms.

4,438,253
POLY(GLYCOLIC ACID)/POLY(ALKYLENE GLYCOL) BLOCK COPOLYMERS AND METHOD OF MANUFACTURING THE SAME

Donald J. Casey, Ridgefield, and Kenneth R. Huffman, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 12, 1982, Ser. No. 441,306
Int. Cl.³ C08G 63/06
U.S. Cl. 528—86 **12 Claims**

1. A multiblock copolymer useful for the manufacture of bioabsorbable surgical articles comprising the formula:



wherein R represents an alkylene group and Ar is an aromatic group, the poly(glycolic acid) content is about 80 to 85 percent, the poly(oxyalkylene) content is about 20 to 15 percent l and m are the same or a different positive integer, and n is 23 to 91.

4,438,254
PROCESS FOR PRODUCING EPOXY RESINS

George A. Doorakian, Bedford, and Marsha A. Paul, Natick, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 28, 1983, Ser. No. 470,107
Int. Cl.³ C08G 59/62, 59/68
U.S. Cl. 528—89 **20 Claims**

1. In a process for preparing an advanced epoxy resin by reacting

(a) a compound bearing an average of more than one vicinal epoxide group per molecule with

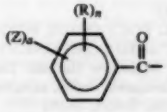
(b) a polyhydric phenol or thiophenol, in the presence of a catalytic amount of a tetrahydrocarbyl phosphonium salt, the improvement wherein the reaction is conducted at a temperature less than about 175° C. and in an essentially anhydrous medium.

4,438,255
ACYLOXY TERMINATED COPOLYESTER-CARBONATES

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 17, 1982, Ser. No. 450,810
Int. Cl.³ C08G 63/64
U.S. Cl. 528—176 **26 Claims**

1. A composition comprising an aromatic copolyester-carbonate chain terminated with at least one residue represented by the general formula



wherein:

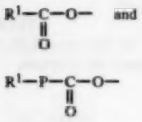
each R is independently selected from monovalent hydrocarbon radicals, substituted monovalent hydrocarbon radicals wherein at least one replaceable hydrogen atom

of said monovalent hydrocarbon radicals has been replaced with an inorganic atom or group, and halogen radicals;

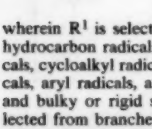
a represents a whole number having a value of from 1 to 3 inclusive;

n represents a whole number having a value of from 0 up to and including the number of replaceable hydrogen atoms present on the ring carbon atoms of the aromatic nuclear residue; and

Z is independently selected from radicals represented by the general formula



and



wherein R^1 is selected from bulky or rigid monovalent hydrocarbon radicals selected from branched alkyl radicals, cycloalkyl radicals, alkyl substituted cycloalkyl radicals, aryl radicals, aralkyl radicals, and alkaryl radicals, and bulky or rigid substituted hydrocarbon radicals selected from branched alkyl radicals, cycloalkyl radicals, alkyl substituted cycloalkyl radicals, aryl radicals, aralkyl radicals, and alkaryl radicals.

4,438,256

COPOLYAMIDE ACID AND COPOLYIMIDE

Takayuki Ohta, Tokyo; Yukio Yanaga, and Seiichi Hino, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

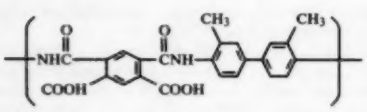
Filed Apr. 6, 1983, Ser. No. 482,417

Claims priority, application Japan, Apr. 24, 1983, 57-69145

Int. Cl.³ C08G 73/10

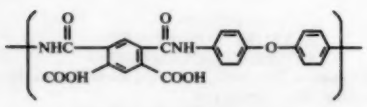
U.S. Cl. 528—188 **5 Claims**

1. A copolyamide acid consisting essentially of repeating units represented by the general formulas:



(A)

and



(B)

in which the repeating unit (A) and the repeating unit (B) are present in a molar ratio from 20:80 to 80:20, and which has a logarithmic viscosity number (η_{inh}) of 0.5 dl/g—10 dl/g measured in N,N-dimethylformamide at a concentration of 0.5 g/dl and at a temperature of 30° C.

4,438,257

PROCESS FOR PREPARING POLYAMIDE WITH MOLTEN DICARBOXYLIC ACID COMPONENT

Akira Miyamoto; Senzo Shimizu; Masahiro Harada; Tamotu Ajiro, and Hideki Hara, all of Kanagawa, Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 451,397

Claims priority, application Japan, Dec. 25, 1981, 56-211767

Int. Cl.³ C08G 69/28

U.S. Cl. 528—347 **12 Claims**

1. A process for preparing a polyamide from a reaction mixture comprising a diamine component containing at least 70 mole % of m-xylylene diamine and a dicarboxylic acid component containing at least 80 mole % of adipic acid at atmospheric pressure, comprising the steps of:

(a) heating and melting the dicarboxylic acid component to produce a molten dicarboxylic acid component;

(b) adding part of the diamine component to the molten dicarboxylic acid component from step (a) in an amount to bring the molar ratio of the diamine component to the dicarboxylic acid component to within the range of from 0.900 to 0.990 in the reaction mixture while raising the temperature of the reaction mixture to a temperature in the range of from a temperature lower than the melting point of the resulting polyamide to a temperature higher than said melting point by a degree not exceeding about 5° C., said temperature being such that the reaction mixture is maintained in a uniformly fluidized state throughout the process;

(c) after the addition of the diamine in step (b) has been completed, raising the temperature of the reaction mixture to a temperature higher than the melting point of the resulting polyamide by a degree of about 10° to 35° C.; and

(d) adding the remainder of the diamine component to the reaction mixture maintained at the temperature defined in step (c) in an amount to bring the overall molar ratio of the diamine component to the dicarboxylic acid component to within the range of from 0.995 to 1.005 to complete the polycondensation reaction.

4,438,258

HYDROGELS

Neil B. Graham, Bearsden, England, assignor to National Research Development Corporation, London, England

Filed Jun. 14, 1982, Ser. No. 387,817

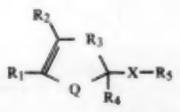
Claims priority, application United Kingdom, Jun. 12, 1981, 8118088; Jun. 12, 1981, 8118089; Jun. 12, 1981, 8118090

Int. Cl.³ C08G 63/66, 65/02

U.S. Cl. 528—361 **32 Claims**

1. A hydrogel, which comprises:

polymerized moieties derivable from (i) at least one unsaturated cyclic(thio) ether of the formula:



wherein

R_1, R_2 and R_4, which may be the same or different, each represent hydrogen or a substituted or unsubstituted hydrocarbyl or hydrocarbyloxy group;

R_3 represents a substituted or unsubstituted methylene, ethylene, or 1,3-propylene group;

R_5 represents a monovalent polymerizable group;

Q represents an oxygen or sulfur atom; and

X represents:

wherein Y represents an oxygen atom or an $—NR_6—$ group wherein R_6 represents any of the values which R_1 may assume; a is 0 or 1; b is 0 or 1; c is 1 or 2; d is 0 or 1; with the proviso that at least one of b or d is 1, and (ii) at least one hydrophilic homo- or copolymer.

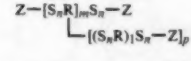
32. A hydrogel, which comprises: a polymerizate derived from the reaction of polyethylene oxide with an acrolein tetramer of the formula:

4,438,259
(VINYLARYL)ALKYL POLYSULFIDE POLYMERS

Victor E. Meyer, and Thomas E. Dergazarian, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 339,820, Jan. 18, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 426,559
Int. Cl.³ C08G 75/00
U.S. Cl. 528—388 22 Claims

1. A curable polysulfide polymer as represented by the general structure



wherein each R is independently a polyvalent organic polyradical with each valence residing on a carbon atom; each Z is independently (vinylaryl)alkyl, inertly substituted (vinylaryl)alkyl or a noncrosslinking monoradical, provided that a sufficient proportion of Z contain a (vinylaryl)alkyl moiety to enable the polymer to cure to a material that does not cold flow; l and m are independently zero or a positive integer; n is a number from about 2 to about 8 provided that when m is zero and each Z is vinylbenzyl, then n is at least 3; and p is zero or a positive integer which is the difference between the valence of R and two.

4,438,260
SISOMICIN COMPOUNDS

Uwe Petersen, Leverkusen; Peter Stadler, Haan; Oswald Lockhoff, Leverkusen; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 24, 1981, Ser. No. 334,401
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101376
Int. Cl.³ C07H 15/22
U.S. Cl. 536—13.9 2 Claims

1. A compound, which is 1-N-([R,S,R,S]-6-Amino-2,3,4,5-tetrahydroxy-hexyloxy-carbonyl)-sisomicin or a salt thereof.

2. A compound, which is 1-N-(3-Amino-2,2-bis-[hydroxymethyl]-propyloxycarbonyl)-sisomicin or a salt thereof.

4,438,261
ANTICOAGULANT SUBSTANCE

William E. Barnett, Clearwater, Fla., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 151,163, May 19, 1980, Pat. No. 4,351,938. This application Jun. 1, 1982, Ser. No. 384,032
Int. Cl.³ A61K 31/725
U.S. Cl. 536—21 3 Claims

1. A chemically partially depolymerized heparin product which has

(1) a weight average molecular weight of from about 2,000 to 4,000 daltons, when determined by HPLC using 1.5 molar aqueous sodium chloride as the mobile phase and dextrans as the standard,

(2) a polydispersity (D) of less than about 2.5, and

(3) analyzable reducing end groups of which a majority are anhydromannose groups.

4,438,262
HIGHLY DIELECTRIC POLYSACCHARIDES

Ichiki Murase, Ibaraki; Fumio Fujita, Osaka; Toshihiro Ohnishi, Takatsuki, and Toshifumi Tamura, Otsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 30, 1982, Ser. No. 429,282
Claims priority, application Japan, Oct. 6, 1981, 56-159647; Aug. 27, 1982, 57-149449
Int. Cl.³ C08B 11/155, 31/08, 37/02
U.S. Cl. 536—43 15 Claims

1. A process for manufacturing a highly dielectric organic compound which comprises reacting a water-soluble polysaccharide or a derivative thereof with a dihydroxyalkylating agent to form a dihydroxyalkylate and then cyanoethylating the dihydroxyalkylate with acrylonitrle.

4,438,263
CELLULOSE GRANULES AND PROCESS FOR PRODUCING THE SAME

Erwin E. Morse, Berlin, N.H., assignor to James River Corporation of Virginia, Richmond, Va.

Filed Aug. 6, 1982, Ser. No. 405,992
Int. Cl.³ C08B 1/00; D21C 9/00, 9/18
U.S. Cl. 536—56 20 Claims

1. A process for producing essentially pure cellulose granules which comprises:

treating finely-divided particles of essentially pure cellulose with an agglutinating reagent in aqueous solution which promotes agglutination of said particles;

causing said particles to agglutinate and mechanically separating the agglutinated cellulose particles from the suspension medium leaving a wet mass of agglutinates;

washing said wet mass with water until said agglutinating reagent has been removed therefrom, leaving a second wet mass consisting essentially of agglutinated cellulose particles and water; and

removing the water from said second wet mass by a non-evaporative procedure wherein coalescence of said agglutinated particles is prevented and said agglutinated particles dry into discrete granules of essentially pure cellulose.

18. Essentially pure cellulose granules suitable for use as an excipient in tableting, characterized as a mass of discrete granules of essentially uniform size and character and by the following properties:

a flow rate greater than about 5 grams per second, as measured in a Flo-Graph TM through a ¼ inch orifice;

a size such that between about 15 to about 80 percent is retained on a 100 mesh screen when 25 grams is sieved in a Ro-Tap TM apparatus for 25 minutes;

a compressibility measured as hardness in Strong-Cobb units of at least 20 to No-Break when 0.4 gram of material predried at 105 degrees Centigrade is compressed into 7/16 inch diameter tablets under 1000 pounds load and the tablets tested in Model 2E Schleuniger hardness tester;

a disintegration time in water without agitation of between about 2 and about 20 seconds for tablets prepared as above; and

a bulk density of less than about 4 ml./gm.

4,438,264

PROCESS FOR THE PRODUCTION OF HYDROXYETHYL METHYL CELLULOSE

Klaus Balser, Walsrode; Helwig Tuebner, Hanau, and Wilhelm Oppermann, Bomlitz, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,272

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1981, 3140813

Int. Cl.³ C08B *11/193*

U.S. Cl. 536—91 **4 Claims**

1. A process for the production of hydroxyethyl methyl cellulose having a flocculation point of at least 100° C., which comprises reacting alkali cellulose with ethylene oxide in the presence of methyl chloride with a molar ratio of methyl chloride to air-dry cellulose amounting to 6–12, alkalisation and hydroxyethylation being carried out in liquid methyl chloride; and isolating the hydroxyethyl methyl cellulose formed.

4,438,265

ESTERS OF 7-SULFENYLIMINOCEPHEM-4-CARBOXYLIC ACIDS

Tetsuo Hiraoka, and Takeo Kobayashi, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 907,772, May 14, 1978, abandoned, which is a division of Ser. No. 779,907, Mar. 21, 1977, abandoned. This application Dec. 5, 1980, Ser. No. 213,763

Claims priority, application Japan, Apr. 5, 1976, 51-37958

Int. Cl.³ C07D *501/14*

U.S. Cl. 544—29 **6 Claims**

1. tert-Butyl 3-methyl-7-paranitrophenylsulfenylimino-3-cephem-4-carboxylate.

6. parabromophenacyl 6-ortho-nitrophenylsulfenyliminopenicillanate.

4,438,266

TRIAZOLOPYRAZINAMINES USEFUL AS ADJUNCTS TO RADIATION THERAPY

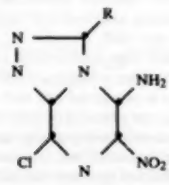
George D. Hartman, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 17, 1982, Ser. No. 379,232

Int. Cl.³ C07D *487/04*; A61K *31/495*; C07D *241/20*

U.S. Cl. 544—350 **3 Claims**

1. A compound of the formula:



wherein R is hydrogen or methyl and pharmaceutically acceptable acid addition salts thereof.

4,438,267

MONOHETERORING COMPOUNDS AND THEIR USE

Susan M. Daluge, 297 Azalea Dr., Chapel Hill, N.C. 27514, and Paul M. Skonezny, 1513 Cotherstone Dr., Durham, N.C. 27712

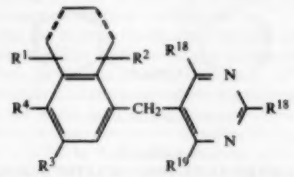
Filed Nov. 9, 1981, Ser. No. 319,644

Claims priority, application United Kingdom, Nov. 11, 1980, 8036135

Int. Cl.³ C07D *239/47, 239/49*

U.S. Cl. 544—309 **1 Claim**

1. A compound of the formula



wherein the dotted lines are both single bonds,

R^{18} is amino or C_{1-4} althylthio or halogen,

R^{19} is hydrogen or halogen provided that both R^{18} groups cannot be amino,

R^1 and R^2 is hydrogen or halogen, C_{1-4} alkyl, C_{1-4} alkylthio, C_{1-4} alkoxy and R^3 and R^4 are hydrogen, halogen, C_{2-4} alkenyl, C_{2-4} alkenyloxy, nitro, cyano, hydroxy or mercapto except that R^1 to R_4 may not all be hydrogen and when R^1, R^2 and R^3 are hydrogen, R^4 may not be hydroxyl.

4,438,268

LIQUID CRYSTAL SUBSTANCES

Horst Zaschke, Plectz der Volkerfreundschaft 3, 4020 Halle; Wolfgang Schafer, auf dern Viewitt 31, 1500 Potsdam; Hans-Joachim Deutscher, Veszpremerstr. 15, 4020 Halle; Dietrich Demus, Valchonweg 22, 4020 Halle, and Gerhard Pelzl, Block 170/2/21, 4020 Halle, all of German Democratic Rep.

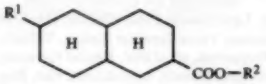
Filed Sep. 14, 1981, Ser. No. 302,288

Claims priority, application German Democratic Rep., Sep. 29, 1980, 224159; Sep. 29, 1980, 224160

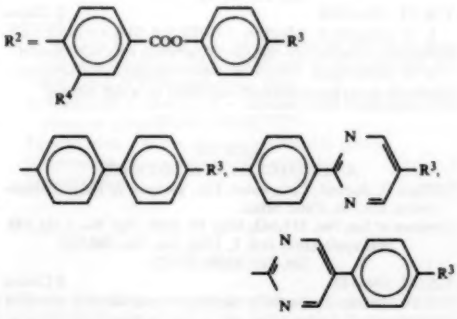
Int. Cl.³ C07C *69/753*; C07D *239/26, 239/28*; C09K *3/34*

U.S. Cl. 544—315 **12 Claims**

1. A liquid crystal trans-6-n-alkyldecalin 2-carbonic acid ester of the general formula



wherein $R^1 = C_4H_9$,



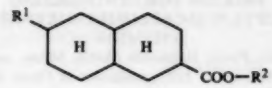
$R^3 = C_5H_{11}$, $-OC_nH_{2n+1}$, —Cl, —Br, —CN, —H

with

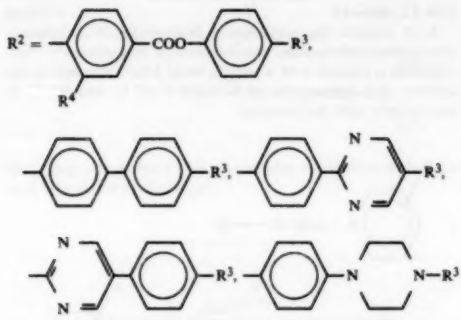
n = 4 to 9

R^4 = —H, —Cl.

12. A liquid crystal trans-6-n-alkyldecalin-2-carbonic acid ester of the general formula



wherein $R^1 = C_nH_{2n+1}$



$R^3 = -C_nH_{2n+1}, -OC_nH_{2n+1}, -OCOOC_nH_{2n+1}, -SC_nH_{2n+1}, -Cl, -Br, -CN, -NO_2, -H,$

with

n=1 to 10

$R^4 = -H, -Cl, -C_2H_5$.

4,438,269

4-DIMETHYLAMINOPYRIDINIUM CHLOROCHROMATE

Frank S. Guziec, Jr., Las Cruces, N. Mex., assignor to Thiokol Corporation, Chicago, Ill.

Filed Aug. 9, 1982, Ser. No. 406,585

Int. Cl.³ C07F 11/00; C07B 3/00; C07D 333/22, 309/12

U.S. Cl. 546—9 **1 Claim**

1. 4-dimethylaminopyridinium chlorochromate.

4,438,270

α-HALOMETHYL DERIVATIVES OF α-AMINO ACIDS

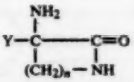
Philippe Bey, Strasbourg, and Michel Jung, Illkirch-Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Continuation of Ser. No. 53,937, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 814,765, Jul. 11, 1977, abandoned. This application Jun. 25, 1982, Ser. No. 392,051

Int. Cl.³ C07D 211/76, 223/10

U.S. Cl. 546—243 **4 Claims**

1. A compound having the formula



wherein Y is F_2CH-, F_3C or Cl_2CH-; and n is the integer 3 or 4.

4,438,271

2-ETHYLSULFONYL PYRIDINE 1-OXIDE DERIVATIVES

Allyn R. Bell; Arthur M. P. Doweyko, both of Cheshire, and John A. Minatelli, Watertown, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,550

Int. Cl.³ C07D 211/72, 211/84, 213/62

U.S. Cl. 546—294 **3 Claims**

1. 2-[1-(2,6-Dichlorophenyl)ethylsulfonyl]pyridine 1-oxide.

4,438,272

SPIRO-(FLUOREN-9,4'-IMIDAZOLIDINE)-2',5'-DIONES

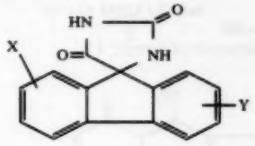
Billie M. York, Jr., Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Apr. 15, 1982, Ser. No. 368,631

Int. Cl.³ C07D 235/02

U.S. Cl. 548—308 **14 Claims**

1. A spiro-(fluoren-9,4'-imidazolidine)-2', 5'-dione or pharmaceutically acceptable salt thereof having the formula



Where

x=hydrogen, fluoro, methylthio, methylsulfinyl, and methylsulfonyl, and

y=fluoro, methylthio, melthylsulfinyl and methylsulfonyl.

4,438,273

ISOIMIDE CONTAINING OLIGOMERS

Abraham L. Landis, Northridge, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

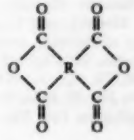
Filed Jul. 24, 1981, Ser. No. 286,317

Int. Cl.³ C07D 307/66, 307/90, 307/77

U.S. Cl. 549—303 **11 Claims**

1. A polymerizable isoimide-containing oligomer prepared by:

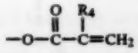
(a) reacting a carboxylic acid anhydride having the formula:



where R is a tetravalent organic group containing 2 to 27 carbon atoms, with a functional amine having the formula:

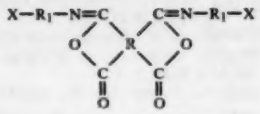
H_2N-R_1-X

wherein R_1 is a divalent organic group containing 1 to 20 carbon atoms and X is a radical selected from the group consisting of —C≡CH, —CH=CH_2, —CN, and



where R_4 is H or CH_3; and

(b) dehydrating the product under conditions to form an isoimide-containing oligomer having the formula:



where R_1 and X are defined above.

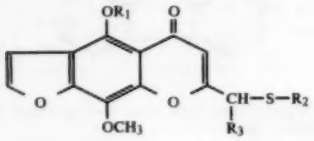
4,438,274

ANTIATHEROSCLEROTIC FUROCHROMONES

Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 17, 1982, Ser. No. 378,700
Int. Cl.³ C07D *311/78*
U.S. Cl. 549—387 **4 Claims**

1. A furochromone of formula I



wherein R_1 is C_{1-4} alkyl;
wherein R_2 is C_{1-6} alkyl; and
wherein R_3 is —O—CO—R_4, wherein R_4 is C_1–C_4 alkyl.

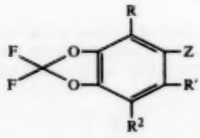
4,438,275

COMBATING ARTHROPODS WITH NOVEL BENZYL ESTERS

Reinhard Lantzsch; Albrecht Marhold, both of Leverkusen; Wolfgang Behrenz, Overath, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 30,579, Apr. 16, 1979, Pat. No. 4,310,540.
This application Jul. 30, 1981, Ser. No. 288,440
Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819788
Int. Cl.³ C07D *317/44*
U.S. Cl. 549—434 **3 Claims**

1. A benzodioxole of the formula



in which
R, R′ and R^2 each is hydrogen or halogen but at least one is halogen, and
Z is CH_2Cl, CH_2Br, CH_2OH, Br or CHO.

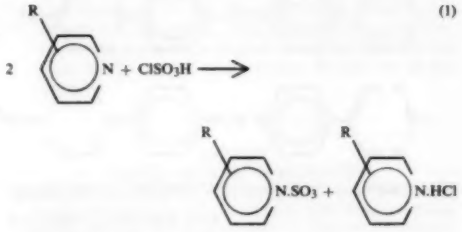
4,438,276

PROCESS FOR SYNTHESIZING N-ISOPROPYL-N′-O-CARBOMETHOXYPHENYLSULPHAMIDE

Nicolo Stabile, Pavia; Raimondo Motta, Milan, and Giancarlo Gosso, Desio, all of Italy, assignors to Oxon Italia S.p.A., Milan, Italy

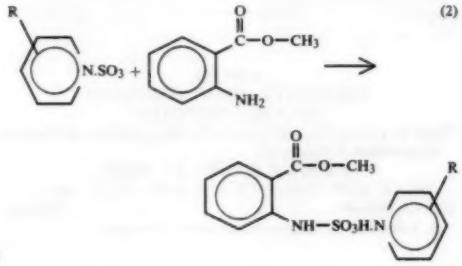
Filed Jul. 13, 1982, Ser. No. 397,878
Claims priority, application Italy, Jul. 17, 1981, 23001 A/81
Int. Cl.³ C07C *143/78*
U.S. Cl. 560—13 **4 Claims**

1. A process for synthesising N-isopropyl-N′-o-carbomethoxyphenylsulphamide, characterised in that sulphuric chlorohydrin is reacted with a pyridic base, which also acts as the solvent, at a temperature of between −10° C. and 50° C. in accordance with the reaction:



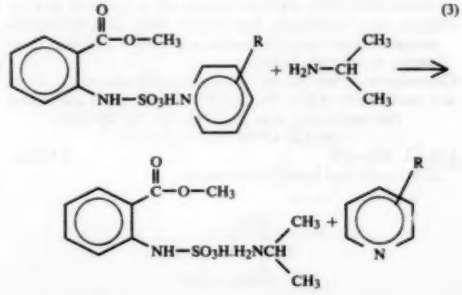
(1)

where R is H or CH_3;
anthranilic acid methyl ester is added at a temperature of between 0° and 60° C. in accordance with the reaction:



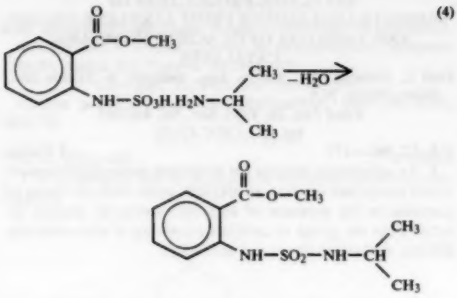
(2)

isopropylamine is added at a temperature of between 0° and 60° C. in accordance with the reaction:



(3)

a dehydrating agent is added at a temperature of between 20° and 80° C. in order to effect the reaction:



(4)

and the product obtained is precipitated by dilution with water and recovered by filtration.

4,438,277

HYDRONAPHTHALENE DERIVATIVES

Akira Terahara; Kiyoshi Hamano; Yoshio Tsujita, and Minoru Tanaka, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

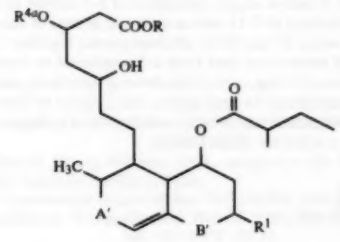
Division of Ser. No. 256,243, Apr. 21, 1981, Pat. No. 4,361,515. This application Apr. 15, 1982, Ser. No. 368,673

Claims priority, application Japan, Apr. 22, 1980, 55-53057

Int. Cl.³ C07C *69/738, 69/734, 69/03*

U.S. Cl. 560—119 **6 Claims**

1. Compounds of formula (Id):



(Id)

wherein:

R represents an alkali metal or a straight or branched chain C_1–C_4 alkyl group;

R^1 represents a hydrogen atom or a methyl group;

R^{4a} represents a hydrogen atom or a straight or branched chain C_1–C_6 alkanoyl group;

A′ represents a group of formula

in which R^8 represents a hydrogen atom, a straight or branched chain C_1–C_4 alkyl group or a straight or branched chain C_2–C_6 alkanoyl group, a group of formula

in which X represents a halogen atom, or a group of formula

and

B′ represents a group of formula

in which R^9 represents a hydrogen atom or a straight or branched chain C_2–C_6 alkanoyl group, a group of formula

in which X is as defined above, or a group of formula

4,438,278

POLYMERIZABLE ETHYLENICALLY UNSATURATED AMIDE COMPOUNDS

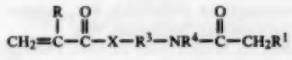
Ignazio S. Ponticello, Rochester; Kenneth R. Hollister, Pittsford, and Richard C. Tuites, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 157,600, Jun. 9, 1980, which is a division of Ser. No. 85,138, Oct. 15, 1979, which is a division of Ser. No. 971,463, Dec. 20, 1978. This application Apr. 19, 1982, Ser. No. 370,001

Int. Cl.³ C07C *103/133*

U.S. Cl. 560—205 **6 Claims**

1. A compound of the formula:



wherein R is hydrogen or methyl; —X— is —NR^4— or —O—; R^1 is cyano or

wherein R^2 is alkyl of 1 to 6 carbon atoms; R^3 is alkylene of 1 to 12 carbon atoms, arylene of 6 to 12 carbon atoms, arylenebisalkylene of 8 to 32 carbon atoms, alkylenebisarylene of 13 to 34 carbon atoms, arylenealkylene of 7 to 24 carbon atoms or cycloalkylene of 4 to 12 carbon atoms; and R^4 is hydrogen or alkyl of 1 to 6 carbon atoms.

4,438,279

FIBER-GRADE TEREPHTHALIC ACID RECOVERED FROM THE EFFLUENT FROM PARAXYLENE OXIDATION IN ACETIC ACID AND THE CATALYTIC HYDROGENATION OF THE OXIDATION EFFLUENT IN THE PRESENCE OF METALLIC PLATINUM FAMILY METALS

Lawrence G. Packer, Lisle, Ill., and Edward J. Schlossmacher, Erie, Pa., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 306,959, Sep. 30, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,487

Int. Cl.³ C07C *51/16, 51/42*

U.S. Cl. 562—416 9 Claims

1. A process for the recovery of terephthalic acid of fiber-grade quality directly from the fluid effluent obtained (a) by catalytically oxidizing p-xylene in the liquid phase at a temperature from 170° C. to 225° C. with air as the source of oxygen and in the presence for 1.0 weight part of p-xylene from 2.0 to 10 weight parts of an acetic acid solution as the reaction solvent containing 0.4 to 22 milligram atoms of cobalt per 1.0 gram mole of p-xylene for each milligram atom of cobalt from 0.05 to 2.0 milligram atoms of manganese and for each milligram atom of total cobalt and manganese from 0.5 up to 1.5 milligram atoms of bromine; (b) heating the resulting fluid oxidation effluent comprising about 3 to 20 weight percent water and about 97 to 80 weight percent acetic acid to a temperature of from 260° C. up to 320° C. under a pressure sufficient to maintain a liquid phase of acetic acid and in the presence of sufficient acetic acid to dissolve all solids present in said effluent at the temperature range of 260° C. to 320° C.; (c) contacting the resulting solution and with hydrogen gas in the amount to provide its partial pressure of from 1.0 up to 15 kg/cm^2 with a platinum family metal catalyst; (d) cooling the hydrogen treated solution to precipitate terephthalic acid therefrom; (e) separating the precipitate from the acetic acid mother liquor; comprising about 97 to 80 weight percent acetic acid, and about 3 to 20 weight percent water; (f) washing the separated precipitate with fresh acetic acid; comprising about 3 to about 20 weight percent water and about 97 to about 80 weight percent acetic acid; and (g) drying the washed precipitate.

4,438,280

BIS-(MALEAMIC ACID) DERIVATIVES OF TRIAMINES

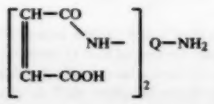
Walter J. Monacelli, St. Petersburg, Fla., assignor to Plastics Engineering Company, Sheboygan, Wis.

Division of Ser. No. 267,379, May 26, 1981. This application Jul. 12, 1982, Ser. No. 397,056

Int. Cl.³ C07C *101/453*

U.S. Cl. 562—457 3 Claims

1. A bis(maleamic acid) derivative of a triamine having the formula:



wherein Q is a trivalent benzenoid aromatic radical.

4,438,281

SELECTIVE PRODUCTION OF MONOALKANOLAMINES FROM ALKYLENE OXIDES AND AMMONIA OVER ACIDIC INORGANIC CATALYSTS

Fred L. Johnson, Jr., Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,505

Int. Cl.³ C07C *85/18*

U.S. Cl. 564—477 8 Claims

1. An anhydrous process for preparing monoalkanolamines which comprises reacting an alkylene oxide with an excess of ammonia in the presence of an acidic inorganic catalyst selected from the group of catalysts consisting of silica-alumina, zeolites, molecular sieves and acid clays.

4,438,282

PREPARATION OF SULFIDES

Hartmut Lardon, Ludwigshafen, and Guenther Seybold, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,105

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125920

Int. Cl.³ C07C *149/30, 149/10*

U.S. Cl. 568—58 21 Claims

1. A process for the preparation of a sulfide of the formula

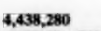
I

where R^1 and R^2 can be identical or different groups and each is alkyl of 1–8 carbon atoms, cycloalkyl of 5–8 carbon atoms, aralkyl or alkylaryl of 7–12 carbon atoms, or phenyl or chlorophenyl, or where R^1 and R^2 as alkylene groups together with the adjacent sulfur atom also form a 5-membered or 6-membered heterocyclic ring, each of the above groups being unsubstituted or substituted by oxo, chloro, nitro, cyano or alkyl or alkoxy of 1–7 carbon atoms each, which process comprises:

reducing a sulfoxide of the formula

 II

where R^1 and R^2 have the above meanings, by reacting it with an amine derivative of the formula

 III

where X is oxygen or

III

and R^3 is hydrogen, a sulfonic acid group or an acyl group of a carboxylic acid, or with its ammonium salt, the carbonyl groups which may be present in R^1 and R^2 being converted to ketoximes in the case in which R^3 is hydrogen and X is oxygen, and to the hydrazones in the case in which R^3 is hydrogen and X is

4,438,283

PROCESS FOR THE PREPARATION OF HYDROXY-KETONES

Karl H. Schulte-Elte, Onex; Roger L. Snowden, Grand-Lancy, and Bernard L. Muller, Geneva, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Jun. 25, 1982, Ser. No. 391,996

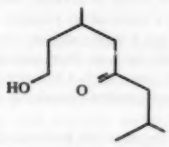
Claims priority, application Switzerland, Jul. 24, 1981, 4842/81

Int. Cl.³ C07C *45/51*

U.S. Cl. 568—403 4 Claims

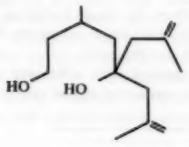
1. A process for the preparation of hydroxy-ketones having formula

(Ia,b)



possessing a double bond in one of the positions indicated by the dotted lines which comprises treating with at least a stoichiometric amount of a strong base, in an inert organic solvent, a diallyl carbinol of formula

(II)



4,438,284

CATALYSTS FOR OXIDATIVE COUPLING OF PHENOLS

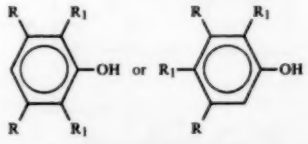
Robert M. Strom, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 241,969, Mar. 9, 1981, abandoned. This application May 17, 1982, Ser. No. 378,674

Int. Cl.³ C07C *39/14*

U.S. Cl. 568—730 14 Claims

1. A process for preparing by an oxidation coupling reaction a carbon-carbon coupled or carbon-oxygen coupled condensation product of a substituted phenol of the formula



wherein each R is hydrogen, halogen or R_1, and each R_1 is a substituent having up to 10 carbons selected from the group consisting of hydrocarbon, halohydrocarbon and hydrocarbonoxy comprising contacting the substituted phenol with an oxygen-containing gas under oxidative coupling conditions in the presence of a heterogeneous catalyst comprising cobalt present in an oxidation state suitable for forming oxidatively coupled reaction products.

4,438,285

PROCESS FOR THE CATALYTIC HYDROGENATION OF 1-4-BUTYNEDIOL TO 1-4 BUTANEDIOL

Franco Codignola, Buenos Aires, Argentina, assignor to S.I.S.A.S. Societa Italina Serie Acetica Sintetica S.p.A., Milan, Italy

Continuation of Ser. No. 184,838, Sep. 8, 1980, abandoned, which is a division of Ser. No. 49,245, Jun. 18, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,913

Claims priority, application Italy, Jun. 16, 1978, 24649 A/78

Int. Cl.³ C07C *31/20, 29/17*

U.S. Cl. 568—861 7 Claims

1. A process for producing 1–4 butanediol comprising reacting 1–4 butynediol with hydrogen in the presence of a catalyst comprising ruthenium and palladium in a weight ratio of about 4:1, at a temperature of from 60° to 180° C. and at a pressure of between 1 to 50 bars.

4,438,286

SUBSTITUTED ESTERS AND ALCOHOLS

Gohfu Suzukamo; Mitsuhisa Tamura, both of Osaka, and Masami Fukao, Shiga, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

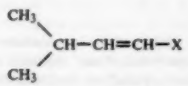
Filed Oct. 8, 1982, Ser. No. 433,443

Claims priority, application Japan, Oct. 16, 1981, 56-166075; Oct. 16, 1981, 56-166076; Oct. 16, 1981, 56-166077; Oct. 16, 1981, 56-166078; Oct. 16, 1981, 56-166079

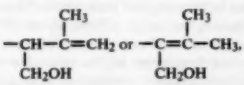
Int. Cl.³ C07C *33/02, 31/125*

U.S. Cl. 568—840 3 Claims

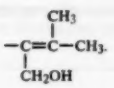
1. A substituted diene alcohol represented by a general formula:



wherein X represents a group of the formula



which has E configuration when X represents a group of the formula



4,438,287

PREPARATION OF ALCOHOLS

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 248,385, Mar. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 93,461, Nov. 13, 1979, abandoned. This application Aug. 25, 1982, Ser. No. 411,213

Int. Cl.³ C07C *29/16*

U.S. Cl. 568—909 11 Claims

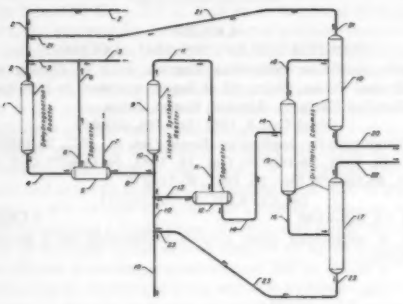
1. A process for the selective preparation of an alcohol hydroformylation product to the substantial exclusion of an aldehyde from a dehydrogenatable aliphatic paraffinic hydrocarbon possessing from 2 to about 30 carbon atoms which comprises the steps of:

(a) dehydrogenating said aliphatic paraffinic hydrocarbon in a dehydrogenation zone in the presence of from about 0.01

to about 2.0 wt. % of a noble metal of Group VIII of the Periodic Table in the elemental metallic state, from about 0.1 to about 5.0 wt. % of at least one element selected from Groups IA and IIA of the Periodic Table present in an oxidation state and from about 0.01 to about 5.0 wt. % of at least one element selected from Groups IVA, VA and VIIB of the Periodic Table present in an oxidation state composited on a porous alumina or silica carrier material to produce a reaction product comprising vaporous light ends and a liquid dehydrogenation effluent mixture comprising both aliphatic olefinic hydrocarbons and aliphatic paraffinic hydrocarbons;

(b) transferring said vaporous light ends and said liquid dehydrogenation products to a gas-liquid separation zone;

(c) separating said vaporous light ends from said liquid dehydrogenation effluent mixture comprising both aliphatic olefinic and aliphatic paraffinic hydrocarbons;



(d) passing said liquid dehydrogenation effluent mixture without any separation of said aliphatic olefinic hydrocarbon from aliphatic paraffinic hydrocarbon to a hydroformylation zone;

(e) hydroformylating said liquid dehydrogenation effluent mixture at hydroformylation conditions which include a temperature in the range of from about 50 to about 350° C. and a pressure in the range of from about 10 up to less than 300 atmospheres by treating said mixture with carbon monoxide and hydrogen in the presence of both a hydroformylation catalyst consisting essentially of a rhodium carbonyl compound and a promoter comprising a trialkyl-substituted amine in which all three of said alkyl moieties are substituted to the nitrogen atom of said amine; and

(f) recovering the selectively produced alcohol.

4,438,288

DEHYDROGENATION OF HYDROCARBONS WITH A HALOGEN CONTACTING STEP

Tamotsu Imai, Mt. Prospect, Ill., and Chi-Wen Hung, San Rafael, Calif., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 477,699, Mar. 22, 1983, which is a continuation-in-part of Ser. No. 326,969, Dec. 2, 1981, abandoned. This application May 19, 1983, Ser. No. 496,146

Int. Cl.[3] **C07C** *5/23;* **B01J** *37/22*

U.S. Cl. 585—379 **13 Claims**

1. A process for dehydrogenating hydrocarbons which comprises the steps of:

(a) contacting a dehydrogenatable hydrocarbon in a dehydrogenation zone with a catalyst comprising a platinum group component, an alkali or alkaline earth component and a porous support material to produce a dehydrogenated hydrocarbon and a used catalyst;

(b) contacting said used catalyst from step (a) above in a catalyst regeneration zone with a halogen component to produce a regenerated catalyst containing added halogen component; and

(c) contacting a dehydrogenatable hydrocarbon in a dehydrogenation zone with said catalyst from step (b) above to produce a dehydrogenated hydrocarbon and a used catalyst.

12. A process for regenerating a dehydrogenation catalyst comprising a platinum group component, an alkali or alkaline earth component and a porous support material with comprises:

(a) burning carbon from the used catalyst at about 850° F. with a regeneration gas stream containing between about 0.3 and 0.8 mol % oxygen, and

(b) contacting the catalyst with a halogen component to provide a catalyst containing added halogen component.

4,438,289

REDUCTION OF CYCLOPENTADIENE FROM ISOPRENE STREAMS

Richard M. D'Sidocky, Ravenna, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 350,913, Feb. 22, 1982, Pat. No. 4,392,004. This application Jul. 1, 1983, Ser. No. 510,471

Int. Cl.[3] **C07C** *7/01, 7/12*

U.S. Cl. 585—827 **4 Claims**

1. A process for the removal of small amounts of cyclopentadiene (CPD) from a C-5 hydrocarbon stream which comprises contacting said stream with activated carbon.

4,438,290

FAST RESPONSE THERMOCOUPLE SURFACE PROBE

Alfred E. Wells, Jr., Rochelle Park, and James H. Casillo, Towaco, both of N.J., assignors to Thermo Electric Co., Inc., Saddle Brook, N.J.

Filed Jun. 15, 1981, Ser. No. 388,695
Int. Cl.³ H01L *35/28*
U.S. Cl. 136—221 9 Claims

1. A thermocouple, comprising:

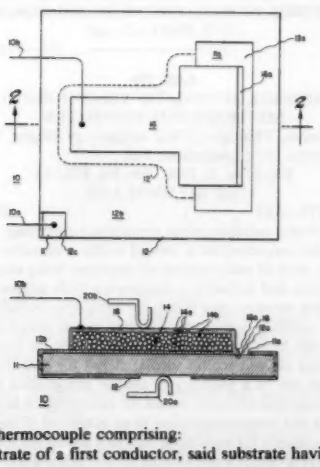
a cylindrical body having a top surface with said top surface having first and second transverse crossing slots, with a first strip of resilent thermocouple material of a first type having end portions extending from the top surface towards the bottom surface of said body and having a bowed central portion positioned above and parallel to said first slot, to form a leaf type spring, a second strip of resilent thermocouple material of a second type having end portions directed from the top surface to the bottom surface of said body and having a bowed central positioned above and parallel to said second slot to form a leaf type spring, whereby said bowed central portions are transvere to and cross each other and as crossing are in contact to form a thermocouple portion with said slots operative to allow said bowed portions to flatten and expand outwardly without contracting said body via the spring action when said strips are forced against a surface upon which a temperature measurement is to be made.

4,438,291

SCREEN-PRINTABLE THERMOCOUPLES

Charles W. Eichelberger, Schenectady; Robert J. Wojnarowski, Ballston Lake, and Abraham Auerbach, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,966
Int. Cl.³ H01J *35/12*
U.S. Cl. 136—236 R 20 Claims



1. A thermocouple comprising:

a substrate of a first conductor, said substrate having a surface;

a layer of insulation fabricated upon at least a portion of said substrate surface, said insulative layer having a surface opposite said substrate;

an ink composition design fabricated upon at least a portion of said insulative layer surface, said ink composition including a polymer having at least 75% by weight of a powdered metal dispersed therein; and

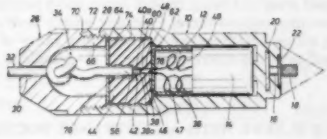
a second conductor, of a material different from said first conductor and from the powdered metal of said ink composition, plated onto at least a portion of each of said ink composition design and also onto said substrate surface, and forming a single thermocouple junction by contact or said second conductor with said substrate conductor.

4,438,292

WATERPROOF HOUSING ASSEMBLY FOR GEOPHONES

James C. Woodall, Houston, Tex., assignor to Mark Products, Inc., Houston, Tex.

Filed Aug. 25, 1982, Ser. No. 411,467
Int. Cl.³ G01V *1/16*
U.S. Cl. 174—52 R 3 Claims



1. A waterproof housing and geophone assembly comprising a housing having an elongated cavity, a geophone in the cavity, means mounting the geophone in the bottom portion of the cavity, a two conductor cable extending into the cavity having a first section with the outer sheath and insulation stripped from the two conductors part of the way back from the end and a second section adjacent the first with the sheath removed from the insulated conductors, a body of elastomeric material in the cavity having a first pair of spaced openings through which the uninsulated first section of the cable extends to be connected to the geophone, a second pair of spaced openings connected to the first pair in which the second section of the cable is located, and a single opening connected to the second pair in which a portion of the sheathed cable is located, and means to compress the body of elastomeric material into sealing engagement with the housing and with the uninsulated conductors, the insulated conductors, and the outer sheath of the cable to prevent water from entering the portion of the housing containing the geophone even if the outer sheath and the insulation on the conductors develop a leak outside the housing.

4,438,293

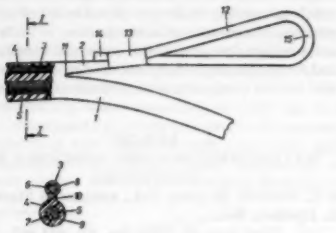
CABLE WITH IMPREGNATED FIBER STRENGTH MEMBER FOR NON-SLIP CLAMPING

Othmar Voser, Möriken, Switzerland, assignor to Kupferdraht-Isolierwerk AG Wildegg, Wildegg, Switzerland

Division of Ser. No. 186,386, Sep. 11, 1980. This application Aug. 28, 1981, Ser. No. 297,341
Claims priority, application Switzerland, Sep. 18, 1979, 8444/79
Int. Cl.³ H02G *15/06, 7/06*
U.S. Cl. 174—79 14 Claims

1. A composite cable comprising a tensile load carrier element, an overhead cable, a common protective covering enclosing said carrier element and said overhead cable and uniting the same, and connecting means transferring a tensile load to said carrier element, said covering comprising two channels, one for said carrier element and one for said overhead cable, said carrier element comprising a bundle of synthetic fibres having smooth surfaces and a tensile strength in excess of 200 kg/mm², a modulus of elasticity in excess of 3000 kg/mm², and

an elongation at rupture of less than 10%, said fibres, in order to reduce the risk of slippage in connecting regions of said carrier element due to their smooth surfaces, being impregnated at least over at least the connecting regions thereof, with a material uniting the fibres of the element and, when subjected



to compressive and/or bonding stress exceeding its ultimate strength for such stress, breaking down into a powder within the stressed areas and being broken down into a powder within the connecting regions thereby causing within such regions a wedging action both between the individual fibres of the bundle as well as at the exterior surface of the bundle as a whole.

4,438,294

CABLE SLEEVE WITH AN ENTRANCE SOCKET OF SHRINKABLE MATERIAL

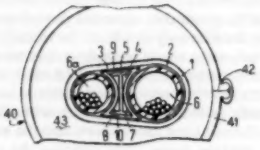
Hans J. Meltsch, Germering, and Jan Rost, Traubing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

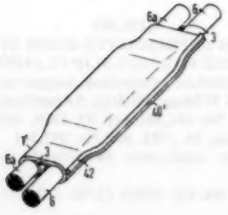
Filed Jan. 5, 1982, Ser. No. 337,295

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104916; European Pat. Off., Jul. 1, 1981, 81105109.3

Int. Cl.³ H02G *15/04*

U.S. Cl. 174—88 R **40 Claims**





1. In a cable sleeve having a longitudinally extending joint and a cable entrance socket at each end of the sleeve, said cable entrance socket consisting of a shrinkable material and receiving a liner element having an axis and having external axially extending recesses for receiving portions of the cables being introduced into the cable entrance socket, and said socket having sealing material for forming a seal between the material of the socket and sheath of the cable engaged by the cable entrance socket, the improvements comprising the liner element consisting of a thermo-plastic, cross-linked material, said element having a shape memory and being shrinkable toward a previous shape when subjected to a shrinking process.

4,438,295

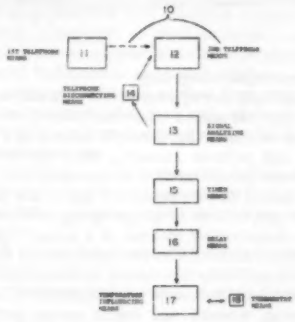
REMOTE TEMPERATURE CONTROL ACTIVATION APPARATUS

Paul D. Hales, P. O. Box 7573, High Point, N.C. 27264

Filed Jun. 1, 1982, Ser. No. 383,538

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—2 A **12 Claims**



1. Apparatus for remote temperature control activation of a structure comprising: a remote code receiving means, a signal transmitting means, said signal transmitting means communicating with said code receiving means, a signal receiving means, said signal receiving means distant from and communicating with said signal transmitting means, signal analyzing means, said signal analyzing means communicating with said signal receiving means, said signal analyzing means including resisting means and thermostatic switch means, said resisting means communicating with said thermostatic switch means, said resisting means being preset to activate said thermostatic switch means upon receiving a predetermined large plurality of signals, each signal corresponding to a conventional telephone ring from a single telephone call, and temperature influencing means, said temperature influencing means communicating with said signal analyzing means whereby said temperature influencing means is activated by said code receiving means.

4,438,296

MULTIMESSAGE AUTOMATIC TELEPHONE POLLING METHODS AND APPARATUS

Fred J. Smith, Plantation, Fla., assignor to Digital Products Corporation, Fort Lauderdale, Fla.

Filed Sep. 2, 1980, Ser. No. 182,943

Int. Cl.³ H04M *3/46*

U.S. Cl. 179—6.02 **33 Claims**

1. Automatic announcement apparatus comprising:

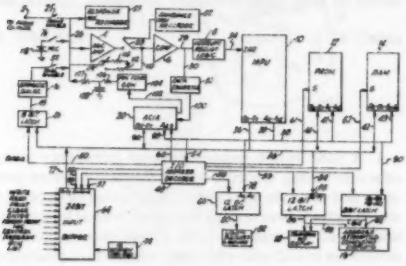
means for recording on a record media a plurality of messages, each of said plurality of messages being recorded in sequence and including a designation code uniquely defining that message, said means for recording including magnetic recorder means, microphone means selectively connectable to said magnetic recorder means for recording a message on said record media, means for selectively supplying one of a plurality of unique designation codes to said magnetic recorder means for recording on said record media and means responsive to an actuation of said microphone means for indicating that said means for selectively supplying one of a plurality of unique designation codes to said magnetic recorder means must be actuated;

means for selectively reproducing from said record media

one message at a time including said unique designation code, said reproducing means having a playback station at which a next message to be reproduced is positioned;

memory means for storing a plurality of data words, each data word defining a particular operation and including bit information representing a designation code corresponding to one of said plurality of messages; and

processor means for reading each of said plurality of data words in a sequence from said memory means, said processor means comparing said bit information representing a designation code corresponding to one of said plurality



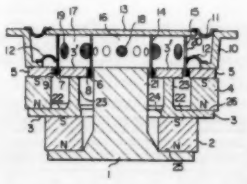
of messages in each data word read with said unique designation code of said next message to be reproduced as positioned at said playback station and attempting to execute said particular operation defined by said data word and to reproduce said next message to be reproduced by said reproducing means only if an affirmative comparison of said bit information and said designation code of said next message is present, said processor means reading a following data word from said memory means without attempting to execute said particular operation defined for a data word for which a negative comparison resulted.

4,438,297

DYNAMIC SPEAKER

Sinichiro Kawamura, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,445
Claims priority, application Japan, Nov. 28, 1980, 55-166538
Int. Cl.³ H04R 9/02
U.S. Cl. 179—117 **4 Claims**



1. A dynamic speaker comprising:

first, second and third magnetic poles arranged in at least three layers in spaced relation with each other;

a first magnet arranged between said first and second magnetic poles;

a second magnet arranged between said second and third magnetic poles;

a fourth magnetic pole interposed between the magnetic path of said first magnetic pole and the magnetic path of said third magnetic pole for forming first and second air gaps within said respective magnetic paths;

a first voice coil inserted into said first air gap;

a second voice coil inserted into said second air gap; and

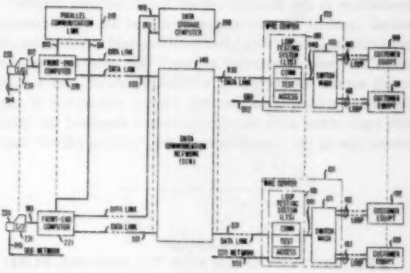
a diaphragm coupled to said first and second voice coils and driven by said first and second voice coils.

4,438,298

SYSTEM FOR ACCESSING AND TESTING SUBSCRIBER LOOPS

Harvey Rubin, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,185
Int. Cl.³ H04M 3/26; H04B 3/46
U.S. Cl. 179—175.2 R **9 Claims**



1. A system, cooperatively arranged with wire center test trunks, for accessing and testing subscriber loops in response to an access request and a test request provided by a system user, said system comprising

first microcomputer means (2000) for receiving and converting said access request and said test request into a corresponding access task and test task,

second microcomputer means (2200), responsive to said first microcomputer means, for processing said access task,

third microcomputer means (e.g., 2101), responsive to said first microcomputer means, for processing said test task, and

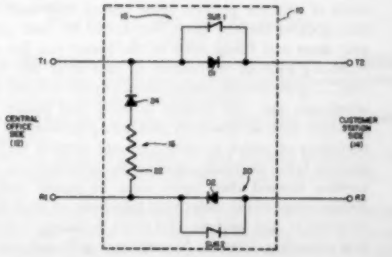
a switching network (2700), interposed between said third means and said trunks and responsive to said second means, for interconnecting one of said loops, via one of said trunks, to said third means.

4,438,299

ON-LINE TELEPHONE TROUBLESHOOTING APPARATUS

William L. Tomim, 520 S. Green Oaks Ct., Addison, Ill. 60101

Filed Feb. 26, 1982, Ser. No. 352,645
Int. Cl.³ H04B 3/46
U.S. Cl. 179—175.3 F **6 Claims**



1. Telephone station isolating apparatus for electrical connection in circuit across the "tip" line and the "ring" line

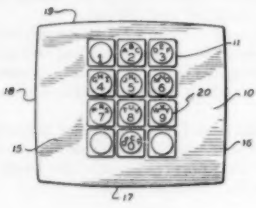
between the "central office" and the "customer station" sides of a telephone network in order to facilitate testing for faults, said apparatus comprising: termination circuit means including a termination resistor and a blocking diode connected in series with each other and arranged to be connected in shunt circuit across the "tip" and "ring" lines with the diode thereof disposed for blocking conduction in the direction from the "tip" to the "ring" line; first control circuit means arranged to be connected in series circuit in the "tip" line between said termination circuit means and the "customer station", said first control circuit means including a blocking diode and a voltage-responsive selective-conduction device connected in parallel with each other with the diode thereof disposed for blocking conduction in the direction from the "customer station"; and second control circuit means arranged to be connected in series circuit in the "ring" line between said termination circuit means and said "customer station" line, said second control circuit means for including a blocking diode and a voltage-responsive selective-conduction device connected in parallel with each other with the diode thereof disposed for blocking conduction in the direction from the "central office" line.

4,438,300

PROTECTIVE COVER FOR TELEPHONE PUSH BUTTON ARRAY

Milton Morse, Fort Lee, N.J., assignor to APM Corporation, Englewood, N.J.

Filed Feb. 23, 1981, Ser. No. 236,757
Int. Cl.³ H04M *1/23*
U.S. Cl. 179—184 **6 Claims**



1. A protective cover for the push-button array of a push-button telephone set, comprising:

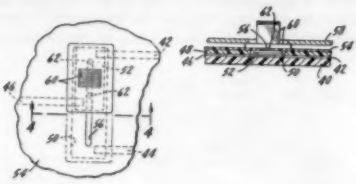
a flexible elastomeric sheet having a grid of upwardly-directed pockets, each of said pockets being defined by substantially vertical side-walls rising above the main plane of said sheet and an upper top portion extending across the tops of said vertical walls, the adjacent vertical walls of adjacent pockets being spaced from each other; said pockets thereby extending above the said plane of said sheet and being open at the lower end for snugly receiving each of the buttons of said array and thereby overlying the corresponding array of push-buttons on said telephone; said top portion of each said pocket being provided with an upwardly protruding portion, the lateral periphery of which is inward of said vertical walls; said pockets being elastically depressible independently of one another toward their open ends, to permit individual displacement of the underlying telephone set push-buttons received in said pockets; said sheet including a skirt portion extending laterally beyond said grid and said sheet being continuous between its lateral edges, whereby said entire push-button array is overlaid by said cover and thereby protected from spillage of liquids or other environmental hazards.

4,438,301

MOVABLE MEMBER MEMBRANE SWITCH

Anthony J. Van Zeeland, Crystal Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Division of Ser. No. 401,075, Jul. 23, 1982, Pat. No. 4,405,841.
This application Mar. 25, 1983, Ser. No. 478,693
Int. Cl.³ H01H *15/00*
U.S. Cl. 200—16 C **3 Claims**



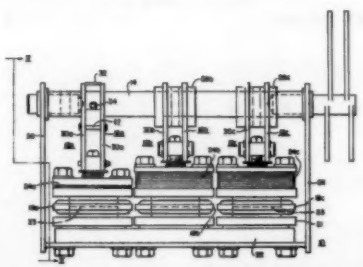
1. A slide switch using membrane technology including a substrate having spaced contacts thereon, a spacer positioned upon said substrate and contacts and having an opening therein which extends over an area in register with at least a portion of said spaced substrate contacts, a slide member positioned for movement in said spacer opening, a membrane positioned upon said spacer and having an opening therein in alignment with said spacer opening, a contact formed on the surface of said membrane facing said substrate and at least in part overlapping the opening in said spacer, said slide member being movable between positions to connect said membrane contact with one or more of said substrate contacts, and an operating member positioned upon said membrane and having means extending through said membrane opening into engagement with said slide member to cause operation thereof.

4,438,302

ELECTRICAL SHORTING SWITCH ASSEMBLY INCLUDING A LAST TO OPEN LAST TO CLOSE ARCING SWITCH

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1982, Ser. No. 349,484
Int. Cl.³ H01H *3/00, 33/66*
U.S. Cl. 200—17 R **6 Claims**



1. An electrical shorting switch assembly for connection across an electrolytic cell as a bypass shorting switch in parallel with the electrolytic cell comprising:

(a) a plurality of hermetically sealed switch modules which are connected in electrical parallel with respect to each other and to the electrolytic cell, with one of the switch modules comprising an arcing switch module which is the last-to-open and lost-to-close switch module;

(b) switch operating means which permits sequential operation of the arcing switch module relative to the other

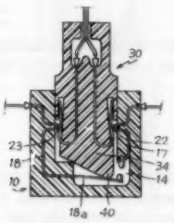
switch modules, including means for determining that the arcing switch module is the last-to-open and last-to-close.

4,438,303

ASSEMBLY FORMING INTERFITTING SOCKET AND PLUG FOR CONNECTION TO A CIRCUIT IN WHICH THE SOCKET IS MOUNTED, WITHOUT THE CIRCUIT OPENING

Louis Astier, 51 avenue du General de Gaulle, Meudon la Foret, France 92360

Filed Apr. 13, 1981, Ser. No. 253,398
Claims priority, application France, Apr. 14, 1980, 80 08280
Int. Cl.³ H01H 27/00
U.S. Cl. 200—51.1 9 Claims



1. An assembly forming an interfitting socket and plug for connection to a circuit in which the socket is mounted, without the circuit opening, wherein:

(a) the socket comprises:

(1) a body made of insulating material and provided with an outwardly open housing:

(2) a switch located in said housing near the bottom thereof and having two contact elements which are borne by conducting blades allowing series connection of the switch to the circuit through said body by being embedded in said insulating material, one of said blades having a rectilinear free end part projecting from said insulating material near the bottom of the housing and forming a substantially rectilinear elastic member bearing one of the contact elements so as to allow the return of the switch into position of closure by an elastic return force and to form a contact by pressure; and

(3) two first branch contact elements integral with said conducting blades and projecting from said insulating material on two opposite side walls of the housing inside said housing; and

(b) the plug comprises:

(1) a push element made of insulating material for opening the switch against said elastic return force when the plug is inserted into the outwardly open housing, said push element having a front end adapted for engagement with said elastic member which extends in a transverse direction with respect to the direction of insertion of the plug into the socket, and said push element having opposite side faces guided along said opposite walls of the housing, whereby the push element occupies virtually the whole width of the housing; and

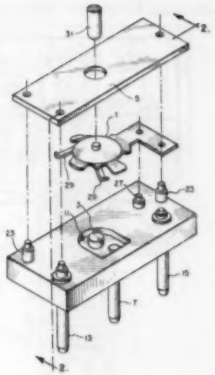
(2) two second branch contact elements located on said opposite side faces of the push element and borne by conducting blades allowing connection of said second branch contact elements to respective conductors through said push element by being embedded in the insulating material thereof, each second branch contact element coming into contact with a respective first branch contact element for a penetration of the plug less than that necessary for opening the switch, so that each pair constituted by a first branch contact element and a corresponding second branch contact element forms a sliding contact, said pressure type contact and said sliding type contacts lying substantially in a same plane parallel to said direction of insertion.

4,438,304

DOUBLE THROW SNAP ACTION SWITCH

Maruice E. Kennedy, Crystal Lake, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Oct. 1, 1982, Ser. No. 432,250
Int. Cl.³ H01H 21/40
U.S. Cl. 200—67 D 14 Claims



1. A snap action switch, comprising:

an electrically conducting terminal plate having at least one aperture formed therethrough;

an electrically conducting stationary contact spaced from said terminal plate;

an electrically conducting contactor means disposed between said terminal plate and said stationary contact,

said contactor means including a snap action dome having at least one cantilevered spring arm for supporting the dome in a stable position in spaced relation to said stationary contact and in conductive contact with the terminal plate; and

pushbutton means mounted over said terminal plate for engaging said dome through said aperture and flexing the dome away from the terminal plate and against the stationary contact when the pushbutton means is pressed, the dome returning to its stable position when the pushbutton means is released.

4,438,305

FIRE RESISTANT PRESSURE SWITCH

James R. Johnson, Johnson County, Kans., assignor to Sor, Inc., Olathe, Kans.

Filed Oct. 13, 1981, Ser. No. 310,783
Int. Cl.³ H01H 35/40
U.S. Cl. 200—83 J 3 Claims

1. A fire resistant switch device responsive to the pressure of a fluid medium, said device comprising:

a housing having a tubular end for connection with the fluid medium;

a pressure responsive piston in said housing supported for movement therein between first and second positions;

a switch element;

actuating means for effecting a first condition of said element when said piston is in said first position and a second condition of the switch element when said piston is in said second position;

yieldable means for urging said piston toward said first position;

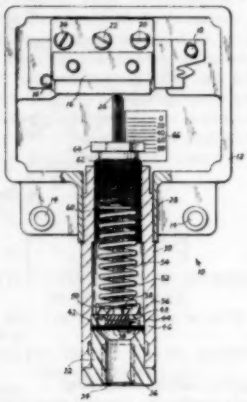
a metal fitting insertable in the said end of said housing, said

fitting located on the opposite side of said piston from said switch, said fitting including

(a) a pressure port therethrough for communication with the fluid medium, said port having opposite ends including an inlet end for the fluid medium,

(b) a flexible metal diaphragm overlying the end of said port opposite the inlet end and having its periphery generally coincident with the periphery of the fitting,

(c) a metal ring member overlying said diaphragm and having its periphery generally coincident with the periphery of said diaphragm,



(d) the adjoining peripheries of said fitting, diaphragm and ring member all being joined together by a continuous weld seam providing a pressure tight connection sealing off the housing from the fluid medium which will remain effective in the event of high temperature destruction of other components of the device,

(e) a movable disk assembly within said ring member and disposed to respond to movement of said diaphragm caused by pressure changes in the medium and operable to move said piston in response to movement of said diaphragm thereby to actuate said piston between said first and second positions.

4,438,306

CIRCUIT INTERRUPTER OPERATING MECHANISM HAVING A CHEMICAL OPERATOR WITH A STATIONARY PISTON

Ronald W. Crookston, Penn Township, Westmoreland County, and Ivan T. Burney, Plum, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1982, Ser. No. 339,605

Int. Cl.³ H01H *33/42*

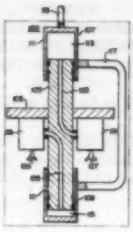
U.S. Cl. 200—148 F **6 Claims**

1. An electric circuit interrupter, comprising:

a pair of separable contacts;

operating means operatively connected to said contacts for opening and closing said contacts;

drive means operatively connected to said operating means for driving the operating means including a stationary drive piston and a movable drive cylinder enveloping said drive piston to define a drive displacement cavity; and



pressure generating means for generating an expulsion of gaseous medium into said drive displacement cavity.

4,438,307

ELECTRIC VACUUM SWITCH

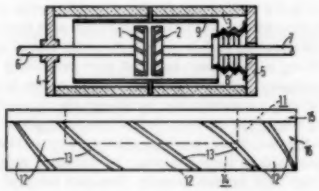
Hans-Joachim Lippmann; Gerhard Peche, and Hans Bettge, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 111,668, Jan. 14, 1980, which is a continuation of Ser. No. 820,796, Aug. 1, 1977. This application Mar. 31, 1983, Ser. No. 480,899

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638700

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **8 Claims**



1. An electric vacuum switch comprising in combination: two cup-shaped switching contact components comprising electrically conductive material and which each have a contact carrier with a base and a cylindrical jacket-shaped wall and having a wall at an end side facing away from the base; a contact ring which is placed onto the wall at the end side facing away from the base and which has a ring-shaped contact surface; the cylindrical wall being divided up into segments by means of radial slots running obliquely to a central axis of said contact components; the electrical conductivity being suddenly reduced at least by a factor of 3 at the junction from said contact carrier to said contact ring by providing the ring with a contact material which has an electrical conductivity lower than that of the carrier at least by the factor 3; said contact carrier comprising primarily copper and the contact ring comprising a chrome matrix with an impregnation metal primarily comprised of copper; at least upper portions of the jacket-shaped cylindrical wall being formed of said impregnation metal and being joined to said contact ring by a back casting of the impregnation metal of the contact ring onto said upper portions, and at least said upper portions of the wall being soldered by a solder layer onto remaining portions of the contact carrier such that said solder layer is arranged deep and away from the contact ring whereby influencing of solder vapor upon the arc is minimized.

4,438,308

PUFFER PISTON CIRCUIT BREAKER

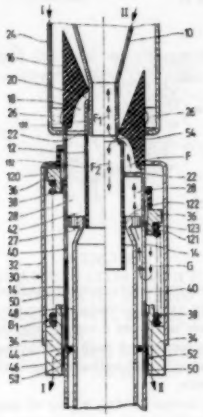
Gerhard Körner, Schriesheim, and Volker Rees, Darmstadt, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 27, 1981, Ser. No. 257,709

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015946

Int. Cl.³ H01H *33/70*

U.S. Cl. 200—148 A 29 Claims



1. A puffer piston circuit breaker having a stationary and a movable contact, at least one of which is tubular in form, and a piston-cylinder puffer assembly fixedly connected with the movable contact such that there is relative displacement of the puffer piston and cylinder toward each other during a disconnecting action to obtain a flow of quenching gas for extinguishing the electrical arc created during the disconnecting action, wherein the improvement comprises a supplemental piston-cylinder assembly which defines a compression space, and means actuated by the current during the disconnecting action for causing said supplemental piston-cylinder assembly to compress said compression space and thereby provide additional quenching gas to said flow of quenching gas.

4,438,309

TOOL HOLDER FOR MANIPULATOR ARM

Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen & Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,262

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3105105

Int. Cl.³ B23K *11/28*

U.S. Cl. 219—86.7 14 Claims

1. A tool holder for a manipulator, said holder comprising:

a tool shaft extending along and rotatable about a main axis and having a tool-shaft end provided with a pivot defining a transverse axis;

a tool carried on said pivot and displaceable relative to said tool shaft about said transverse axis;

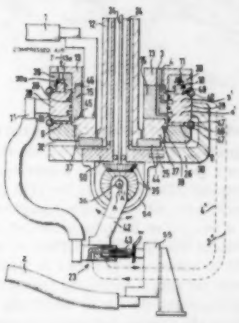
a support adjacent said tool;

a stack of guide rings coaxially surrounding said tool shaft adjacent said pivot, rotationally fixed on said tool shaft, and formed with at least two throughgoing guide-ring passages each having a radially outwardly opening passage end, two of said guide rings defining a pair of axially spaced annular confronting guide-ring surfaces;

a connector ring rotatable on said stack between said guide-ring surfaces at the outwardly opening ends of said guide-ring passages and having one axially directed connector-ring surface axially directly confronting one of said guide-ring surfaces and an oppositely axially directed connector-ring surface axially directly confronting the other of said guide-ring surfaces, said connector ring being formed with respective radially inwardly open grooves confronting the opening into said outwardly opening ends of said guide-ring passages;

means including respective fluid lines connected between said grooves and said tool for feeding a fluid from said passages through said tool;

connector means for securing said connector ring to said tool-shaft end for joint rotation of same about said main axis;



an electrical conductor connected to the guide ring of said one guide-ring surface;

a flat contact element secured to one of said one surfaces and axially flatly engageable with the other of said one surfaces, whereby current can be transmitted between said connector ring and said guide ring of said one guide-ring surface by said contact element;

means including a piston-and-cylinder assembly and a spring engaged between said connector ring and the other of said guide-ring surfaces for pressing said one surfaces and contact element together axially; and

means including an electrical line connected between said connector ring and said tool for feeding electricity through said connector ring to said tool.

4,438,310

METHOD AND APPARATUS FOR INDUCTIVELY HEATING VALVE SEAT INSERTS

John F. Cachat, Cleveland, Ohio, assignor to Park Ohio Industries, Inc., Cleveland, Ohio

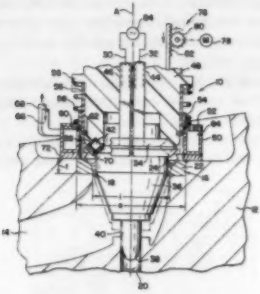
Continuation of Ser. No. 349,037, Feb. 16, 1982, abandoned, which is a continuation of Ser. No. 147,829, May 8, 1980, abandoned. This application Jun. 13, 1983, Ser. No. 501,755

Int. Cl.³ H05B *6/40, 6/14*

U.S. Cl. 219—10.43 8 Claims

1. A method of inductively heating a conical valve seat surface of a valve seat insert coaxially aligned within a bore in an engine component, said insert having a lower coefficient of thermal expansion than said engine component, said method comprising the steps of: providing a ring inductor having a face generally matching said valve seat surface; positioning said inductor in generally axially aligned relation to said valve seat insert with the said face located opposite and spaced a selected distance from said valve seat surface; energizing said inductor to inductively heat said valve seat surface; and shield-

ing the portion of said engine component immediately surrounding said insert from penetration and inductive heating by



stray flux generated by said inductor during the said energizing thereof.

4,438,311

INDUCTION HEATING COOKING APPARATUS

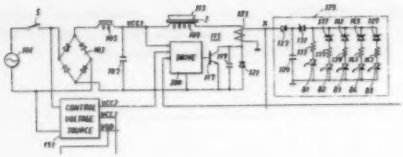
Yoshihisa Tazima; Masayuki Morishima, both of Kiryu; Hiroshi Okumura, and Shin-ichi Kasahara, both of Ashikaga, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Jun. 26, 1980, Ser. No. 163,088

Claims priority, application Japan, Jul. 5, 1979, 54-85638; Jul. 5, 1979, 54-85639; Jul. 5, 1979, 54-85640

Int. Cl.³ H05B *6/06*

U.S. Cl. 219—10.49 R **26 Claims**



1. An induction heating cooking apparatus, comprising:

power supply means for supplying an electric power,

high frequency oscillating means being supplied with said electric power for causing high frequency oscillation during predetermined intervals, said high frequency oscillation being caused during an oscillation interval and being stopped during a non-oscillation interval,

induction heating coil means coupled to said high frequency oscillating means for receiving a high frequency current from said high frequency oscillating means for generating a high frequency alternating magnetic field for induction heating a load by said alternating magnetic field,

oscillation detecting means for detecting the output of said high frequency oscillating means during a time corresponding to a said non-oscillation interval, and

means responsive to the oscillation detected output from said oscillation detecting means during said time of detection for stopping said high frequency oscillation by said high frequency oscillating means during the intervals when high frequency oscillation is normally produced.

4,438,312

METHOD OF AND DEVICE FOR CONDUCTING MACHINING CURRENT TO A WIRE-ELECTRODE TOOL IN A WIRE-CUTTING ELECTROEROSION MACHINE

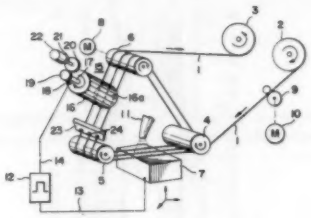
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed May 28, 1981, Ser. No. 268,012

Claims priority, application Japan, Jun. 4, 1980, 55-77677[U]

Int. Cl.³ B23P *1/10, 1/12*

U.S. Cl. 219—69 W **7 Claims**



1. A traveling-wire electroerosion machine, comprising:

drive means for axially moving a wire-electrode tool which is tautly stretched from a supply site to a collection site, along a predetermined path continuously extending between said supply and collection sites through the region of a workpiece;

power supply means having a pair of output terminals for feeding a machining current between said moving wire-electrode tool and said workpiece across a machining gap flooded with a liquid machining medium; and

a device for conducting said machining current to said moving continuous wire electrode tool from said power supply means, the device comprising:

a brush block electrically connected to one of said output terminals and having a planar current-conducting surface disposed at a location in said predetermined path for making sliding electrical contact with said axially moving wire-electrode tool,

a rotary shaft secured to said brush block and having an axis of rotation generally perpendicular to said planar current-conducting surface, and

motor means drivingly coupled to said rotary shaft for rotating said brush block about said axis to rotationally move said planar current-conducting surface in tangential sliding contact with said axially moving continuous wire-electrode tool.

4,438,313

ELECTROSLAG WELDING METHOD

Anatoly N. Safonnikov, and Anatoly V. Antonov, both of Kiev, U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona and Akademii Nauk Ukrainsko, both of, U.S.S.R.

PCT No. PCT/SU80/00116, § 371 Date Feb. 18, 1982, § 102(e) Date Feb. 18, 1982, PCT Pub. No. WO82/00110, PCT Pub. Date Jan. 21, 1982

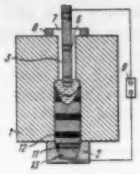
PCT Filed Jun. 30, 1981, Ser. No. 355,595

Int. Cl.³ B23K *25/00*

U.S. Cl. 219—73.1 **6 Claims**

1. A method for electroslag welding of metal segments by a large-section electrode, comprising the steps of establishing a slag bath, fusing an electrode and edges of the metal segments being weld-joined, filling with the metal being fused an inlet metal mould and the gap between the edges of the metal segments, and subsequently removing an inlet shrinkhead, wherein the improvement comprises the electrode being, in establishing the slag bath and filling with metal the inlet metal mould, fused at a rate lower than the electrode fusion rate in filling with metal the gap between the edges of the metal

segments being weld-joined at constant electrical parameters of the electroslag welding, and a brittle interlayer between the



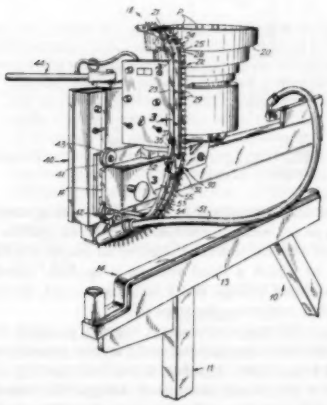
inlet shrinkhead and the weld being formed in the course of welding, the weld being made so that it has a low electrical resistance.

4,438,314

WELD PIN APPLICATOR DEVICE HAVING AUTOMATIC RELOAD

Charles Giannone, Babylon, N.Y., assignor to Duro-Dyne Corporation, Farmingdale, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,247
Int. Cl.³ B23K 9/20
U.S. Cl. 219—98 8 Claims



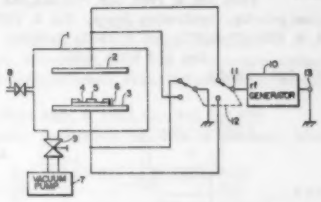
5. A weld pin attachment apparatus comprising a frame, an elongate, horizontally disposed ground electrode mounted on said frame, a carrier beam disposed above said electrode in parallel spaced relation thereto, a weld head assembly movably mounted on said beam and including a weld electrode shiftable toward and away from said ground electrode, upwardly directed receiver track means on said assembly for storing a plurality of pins and feeding same to said weld electrode, orienting hopper means on said frame for storing a supply of said pins and delivering same in oriented condition at a downwardly directed discharge station, stop means at said discharge station blocking downward flow of said pins from said station, and means on said receiver track means for clearing said stop means from said blocking position responsive to movement of said weld head assembly along said carrier beam to move said receiver track into registry with said discharge station, thereby to refill a stack of pins into said receiver track.

4,438,315

HIGH SELECTIVITY PLASMA ETCHING APPARATUS

Hiroyasu Toyoda; Hiroyoshi Komiya, and Hideaki Itakura, all of Kanagawa, Japan, assignors to VLSI Technology Research Association

Division of Ser. No. 183,710, Sep. 3, 1980, Pat. No. 4,348,557.
This application Aug. 26, 1981, Ser. No. 296,407
Claims priority, application Japan, Dec. 12, 1979, 54-163006
Int. Cl.³ B23K 9/00; C23F 1/02
U.S. Cl. 219—121 PE 4 Claims



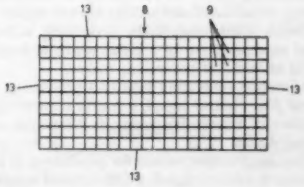
1. A parallel-plate type gas plasma etching apparatus for preferentially etching a workpiece having a multilayer structure composed of layers of Si and SiO_2, comprising: a reactor; a pair of parallel-plate electrodes disposed in said reactor, one of said electrodes being adapted to receive a workpiece disposed thereon; means for supplying said reactor with an etching gas consisting of CHF_3 at a pressure of 10 mTorr to 100 mTorr; and rf power generator means for applying rf power between said electrodes in a cathode-coupling mode by a rf power generator to cause said etching gas to assume a plasma state, the output frequency of said rf power generator means being limited to a range of 400 KHz to 10 MHz, and wherein the one of said electrodes upon which said workpiece is disposed is connected to a high voltage output terminal of said rf power generator and the other of said electrodes is grounded.

4,438,316

NOISELESS COMBUSTION AND PLASMA CUTTING ARRANGEMENT

Ulrich Ackermann, and Eggo Ratsch, both of Berlin, Fed. Rep. of Germany, assignors to Versuchsanstalt f. Deutsche Forschungs-u Luft-u Raumfahrt e.V, Cologne, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,365
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1980, 3042347
Int. Cl.³ B23K 9/00
U.S. Cl. 219—121 PC 11 Claims



1. Low-noise flame and plasma arc cutting arrangement, comprising: cutting means above an associated honeycomb-type bench for supporting a workpiece, said bench being divided into a plurality of individual cells that are substantially higher than they are wide for reducing noise occurring during cutting of the workpiece; said cells in the bench having walls comprising reverberating material; said cells having a depth for permitting multiple reflections of sound against said walls of reverberating material so that sound generated below the workpiece is repeatedly reflected against the inside surface of

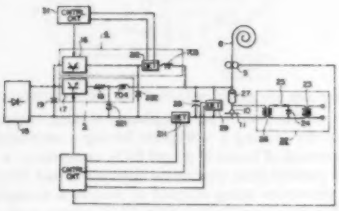
the cells and become thereby diminished, said walls being substantially free of sound absorbing material, noise reduction occurring by said multiple reflections of sound.

4,438,317

PULSE ARC WELDING MACHINE

Shigeo Ueguri; Hirotsugu Komura, both of Hyogo, and Takaji Mizuno, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,263
Claims priority, application Japan, Jul. 8, 1980, 55-93069; Jul. 8, 1980, 55-93077; Jul. 8, 1980, 55-93086
Int. Cl.³ B23K 9/09
U.S. Cl. 219—130.51 **5 Claims**



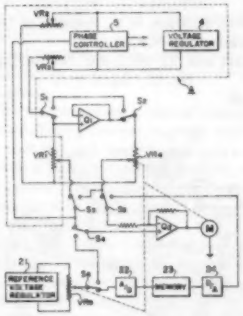
1. A pulse arc welding machine comprising:
- a wire feeding unit for feeding a wire electrode to a base material to be welded;
- a base current source for supplying a base current between said wire electrode and said base material;
- base current setting means for controlling said base current source;
- a pulse current source for supplying a pulse current superposed on said base current flowing between said wire electrode and said base material;
- means for detecting an arc voltage of an arc discharge between said wire electrode and said base material;
- integrating means for integrating an output of said arc voltage detecting means;
- wire feeding speed instructing means for providing a first control signal representative of a desired wire feeding speed;
- wire feeding speed setting means for controlling said wire feeding unit in response to said first control signal;
- first function generating means for producing, in response to said first control signal, a second control signal representative of said arc voltage as a function of said first control signal;
- first comparing means for comparing an output of said integrating means with said second control signal;
- pulse width setting means for producing a third control signal representative of a pulse width in response to an output of said first comparing means;
- second function generating means for producing, in response to said first control signal, a fourth control signal representative of a pulse frequency as a function of said first control signal;
- pulse frequency setting means for producing, in response to said fourth control signal, a fifth control signal indicative of a pulse frequency, said fifth control signal being applied to said pulse current source for controlling a frequency of said pulse current;
- means for detecting a sum of said base current and said pulse current and providing a signal representative of said sum;
- amplifying means for amplifying said signal representative of said sum of said base current and said pulse current;
- pulse peak current selecting means for producing a sixth control signal representative of a current during a pulse peak period in response to said third and fifth control signals and an output of said amplifying means;
- second comparing means for comparing a fixed reference value with said sixth control signal; and
- pulse peak current setting means for controlling said pulse current source for setting a pulse peak current of said pulse current in response to an output of said second comparing means.

4,438,318

METHOD AND DEVICE FOR AUTOMATICALLY CONTROLLING WELDING CONDITIONS FOR USE IN AN ARC WELDING MACHINE

Hideo Suzuki, Yokohama, Japan, assignor to Okamura Corporation, Yokohama, Japan

Filed Nov. 3, 1981, Ser. No. 317,879
Int. Cl.³ B23K 9/10
U.S. Cl. 219—137 PS **4 Claims**

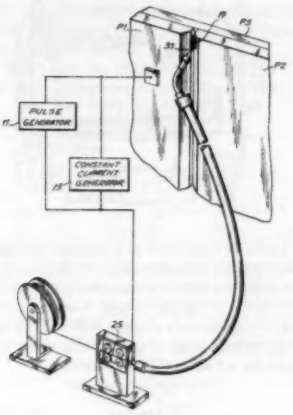


1. A method for automatically controlling welding conditions for use in an arc welding machine, wherein an ignition or turn-on phase of a thyristor is controlled by an output of a first potentiometer to which a fixed voltage is applied, thereby controlling a welding voltage and a welding current, the improvement which comprises the steps of:
- (a) detecting a difference between voltages of movable terminals of the first potentiometer and a second potentiometer which are coupled together at one end directly and coupled at a second end through a voltage follower circuit, by a differential amplifier to which the two voltages of the movable terminals are input;
- (b) turning movable terminals of the second potentiometer and a third potentiometer which are operated synchronously by a motor so that the voltage difference detected between the movable terminals of the second and third potentiometers may be zero;
- (c) storing the output of the third potentiometer to which a fixed reference voltage is applied, into a memory;
- (d) feeding the output read out of the memory and the output of the third potentiometer into the differential amplifier;
- (e) detecting the voltage difference between the two outputs by the differential amplifier; and
- (f) turning the movable terminal of the second potentiometer according to the detected voltage difference by the motor, while the first potentiometer is replaced by the second potentiometer in order to control the ignition phase of the thyristor.

4,438,319
PROCESS FOR WELDING METAL ARTICLES

Roger Blot, Montigny-Cormeilles, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 217,665, Dec. 18, 1980, abandoned.
This application Aug. 3, 1982, Ser. No. 405,166
Claims priority, application France, Dec. 27, 1979, 79 31773
Int. Cl.³ B23K 9/09
U.S. Cl. 219—137 PS 4 Claims



1. A process for pulsed-arc welding a metal article in a non-horizontal position, comprising the steps of:

supplying a substantially constant base current having a base current level to a consumable flux coated or cored wire in the torch, the flux being of the basic type, and the substantially constant base current being sufficient to establish an ac between the electrode and the article;

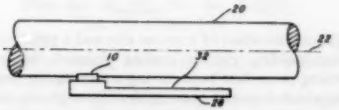
supplying to the electrode current pulses having a maximum current level and a substantially constant frequency, the current pulses being sufficient to produce a transfer of metal in which no short circuit occurs between the electrode and the articles; and

protecting the arc and the pulsed transfer of metal with an inert gas.

4,438,320
THERMAL PRINTING APPARATUS HAVING A THERMAL PRINTHEAD SUBSTRATE WITH SPECIAL GEOMETRY FOR BI-DIRECTIONAL PRINTING

Thomas R. Woodard, Austin, and Kenneth L. Martin, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 9, 1979, Ser. No. 82,443
Int. Cl.³ H05B 1/00
U.S. Cl. 219—216 2 Claims



1. Thermal printing apparatus comprising:

(a) a cylindrical, rotatable platen for supporting a thermally sensitive medium,

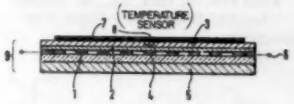
(b) a thermal printhead, movable from left to right and right to left with respect to the platen, with a substantially planar face adapted to contact portions of said thermally sensitive medium and to form visual markings thereon, and

(c) a lapped ceramic substrate for supporting said thermal printhead in contact with said thermally sensitive medium with said planar face substantially parallel to the longitudinal axis of said platen said lapped ceramic substrate being configured to avoid contact with said thermally sensitive medium.

4,438,321
FIXING DEVICE FOR COPIER

Roland Moraw, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,550
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3109164
Int. Cl.³ G03G 15/20; H05B 3/02
U.S. Cl. 219—216 9 Claims



1. A fixing device for an electrophotographic copier, comprising a heater plate for fixing the toner image of a recording support passing over the surface of said heater plate, wherein said heater plate comprises a multiple-layered laminate including:

a contact layer for contacting the recording support;

a heating layer;

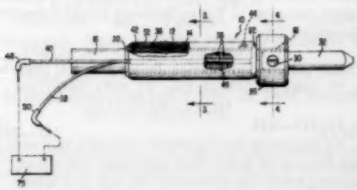
at least first and second heat-insulating layers, one provided on either side of said heating layer, said heat-insulating layers being selected so as to provide for a lower heat capacity of said heater plate during the heating-up operation and until it reaches the working temperature than the heat capacity during continuous operation; and

a heat-accumulating layer, wherein said first insulating layer is adjacent to said contact layer and said second insulating layer is in contact with said heat-accumulating layer.

4,438,322
CERAMIC COATED ELECTRIC HEATER ASSEMBLY FOR TOOLS

Frank Sylvia, Columbia, Md., assignor to Pace Incorporated, Laurel, Md.

Filed Jun. 16, 1981, Ser. No. 274,224
Int. Cl.³ H05B 3/40; B23K 3/02; H01C 1/148
U.S. Cl. 219—236 3 Claims



1. A heater assembly for tools having a heated tip comprising:

(a) a tubular metal base having an open end adapted to receive and hold the end of a tool tip in heat conductive relationship therewith,

(b) a coating of insulating material on a portion of the exterior of said base,

(c) a length of resistance-type wire wound on said coated portion and around said base,

(d) lead wires connected to respective ends of said resistance wire, each of said lead wires being in lapped relationship to the respective end of said resistance wire and including a first portion lying between several turns of resistance wire and said insulating coating, a second portion overlaying said several turns of said resistance wire, said second portion in turn being wrapped with at least one additional turn of said resistance wire to form a terminal therewith, and

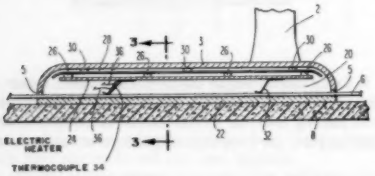
(e) a coating of insulating material on said resistance wire and said terminal formed at each end of said wire to seal same from the deleterious effects of the atmosphere.

4,438,323

CARPET SEAMING TAPE ACTIVATOR

Kenneth B. Milnes, Box 134, Meadowbrook, Pa. 19046

Filed Feb. 18, 1981, Ser. No. 235,507
Int. Cl.³ D06F *75/08*; H05B *1/00*
U.S. Cl. 219—243 **16 Claims**



1. Carpet seaming apparatus comprising:

a heating means having an enclosed tunnel, said tunnel being adapted to receive a heat-activated adhesive tape through said tunnel;

said heating means having an insulated bottom, said bottom comprising means for supporting the tape while the tape is within the tunnel;

an electrical heating element disposed within the tunnel; a heat reflecting means, mounted within the tunnel and above the heating element;

at least one strut disposed, within the tunnel, between the heating element and the bottom; and

a thermocouple, disposed within the tunnel and positioned to sense the temperature of the heat-activated adhesive tape.

4,438,324

ELECTRIC RICE COOKER

Ryuho Narita; Kenji Yamamori, both of Nagoya; Hiroyuki Oota, Iwakura, and Terutaka Aoshima, Toyohashi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 23, 1982, Ser. No. 443,893
Claims priority, application Japan, Dec. 21, 1981, 56-207332; Dec. 21, 1981, 56-207333; Dec. 27, 1981, 56-207334
Int. Cl.³ F27D *11/02*
U.S. Cl. 219—441 **10 Claims**

1. An apparatus for electrically cooking rice with an appropriate amount of water, said apparatus comprising:

a cooking kettle for containing the rice and water;

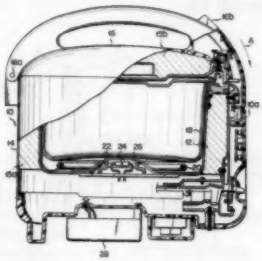
a removable lid covering the top of said kettle;

electrical heater means provided adjacent to the outside surface of said kettle, for heating said kettle and the contents thereof;

thermal insulating frame means for supporting and enclosing said kettle and said heater means;

measuring means for measuring the actual kettle temperature at a predetermined time to produce a first electrical signal corresponding to the actual kettle temperature; and

controlling means, connected to said heater means and said measuring means, for determining into which one of a plurality of predetermined temperature ranges the actual kettle temperature falls, in response to the first electrical signal, and for controlling said heater means so as to maintain said



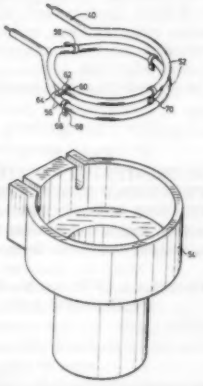
cooking kettle at least once at a suitable temperature for a first predetermined time interval at the beginning of cooking operation based on which predetermined temperature range said actual kettle temperature falls, whereby the rice in said cooking kettle effectively absorbs water at the suitable temperature in the beginning of the cooking operation in accordance with the actual kettle temperature.

4,438,325

TUBULAR ELONGATED INJECTION MOLDING ELECTRIC HEATING ELEMENT WITH SPACER CLIPS

Jobst U. Gellert, 7A Prince St., Glen Williams, Canada

Filed Dec. 24, 1981, Ser. No. 334,154
Claims priority, application Canada, Dec. 10, 1981, 392020
Int. Cl.³ H05B *3/06*
U.S. Cl. 219—536 **5 Claims**



1. The combination of a spacer clip and a tubular elongated injection molding electric heating element, the spacer clip comprising an endless band having a rectangular shaped cross section which forms an opening therethrough, the diameter of the opening being greater than the diameter of the heating element whereby an end of the heating element may be inserted through the opening and the band slipped along the heating element to a predetermined position, the band being crimped around the heating element whereby a first portion of the band is forced into contact against the outer surface of the heating element and a second portion of the band is shaped to

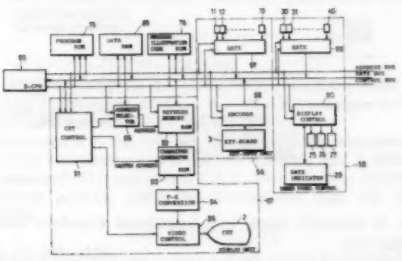
form a radially extending finger, the band being formed of a material having a combination of the necessary strength and pliability whereby the contact between the first portion of the band and the heating element secures the clip in said position and in a predetermined orientation against longitudinal or rotational motion relative to the heating element and the finger has sufficient rigidity to provide a miminum spacing from a body against which the finger projects at least equal to the length of the finger.

4,438,326

SYSTEM FOR PERFORMING TRANSACTIONS

Yasuo Uchida, Takatsuki, Japan, assignor to Omron Tateisi Electronics Company, Kyoto, Japan

Filed Jun. 24, 1981, Ser. No. 276,793
Claims priority, application Japan, Jun. 24, 1980, 55-86279
Int. Cl.³ G06F *15/30*; G07F *7/08*
U.S. Cl. 235—379 **17 Claims**



5. A transaction performing system operable by a customer for executing one of a plurality of transactions, each of said transactions requiring the sequential performance of a plurality of function steps by said customer, said system also including clerk operable malfunction detection and correction means, said system comprising:

electronic memory means having stored therein a plurality of transaction procedure step messages and a plurality of textual messages representing possible system malfunctions and corrective procedures therefor;

electronic display means capable of displaying said textual messages;

first means operable by said customer to cause said display means to display sequentially the transaction procedure step messages to instruct said customer to perform each function step of a desired transaction; and

second means operable by said clerk, when a malfunction is detected, to cause said display means to display a textual message which identifies the cause of said detected malfunction and provides instructions for correcting said malfunction.

4,438,327

BAR CODE READING SYSTEM AND METHOD

Robert E. Smith, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Apr. 21, 1982, Ser. No. 370,373
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—462 **20 Claims**

1. A method of reading a bar code label, said method comprising the steps of:

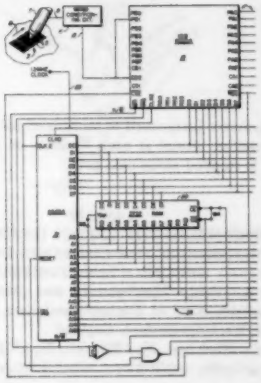
(a) producing an analog signal in response to scanning of the bar code label, said analog signal including signals representative of amounts of light reflected from bars and spaces of the bar code label, the widths of said bars and spaces being representative of whether said bars and spaces represent first or second logical states;

(b) amplifying and shaping said analog signal to produce a raw data signal including a plurality of pulses, the durations of consecutive ones of said pulses corresponding to the widths of consecutive bars, respectively, of said bar code label, the durations of consecutive intervals between said pulses corresponding to widths of consecutive ones of said spaces, respectively, said bar code label including at least one character including a plurality of said bars and spaces;

(c) measuring the durations of each of a plurality of said pulses and intervals of at least said one character of said bar code label to produce a plurality of digital duration numbers representative of said plurality of durations, respectively, and storing said plurality of digital duration numbers;

(d) computing a first reference number;

(e) comparing each of said digital duration numbers to said first reference number and producing a first binary number having a plurality of bits corresponding, respectively, to the bars and spaces of said character, each of said bits being equal to said first logical state if a corresponding one of said digital duration numbers is less than said first reference number, each of said bits being equal to said second digital state if a corresponding one of said digital duration numbers is greater than said first reference number;



(f) determining if said first binary number is an acceptable number in accordance with a predetermined criteria, and decoding said first binary number, if it is acceptable, to determine what said character is; and

(g) adjusting the value of said first reference number by a predetermined amount if said first binary number is not acceptable and repeating steps (e) and (f).

4,438,328

CARD READER FOR READING INFORMATION CARRIED ON TAG CARDS

Masaaki Kuranishi, and Yasuhiko Togo, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

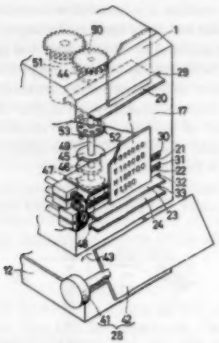
Filed Sep. 21, 1981, Ser. No. 304,156
Claims priority, application Japan, Sep. 25, 1980, 55-134910
Int. Cl.³ H01M *1/48*
U.S. Cl. 235—181 **9 Claims**

1. A card reading assembly for reading cards having information stored thereon at locations spaced along a first dimension of said card, comprising:

a travel path along which said cards unidirectly pass, said cards passing along said path with their first dimension parallel to the direction of said path;

a plurality of travel stops disposed along said path to block said path and thereby interrupt movement of said cards therealong;

means for sequentially driving said travel stops to step said card along said path; and



reading means juxtaposed to said travel path for reading the information stored at each location on said card as said card is stepped along said path.

4,438,329

MINIMIZING THE EFFECT OF SPURIOUS PHOTODETECTOR CURRENTS IN FLASH SPECTROFLUORIMETRY

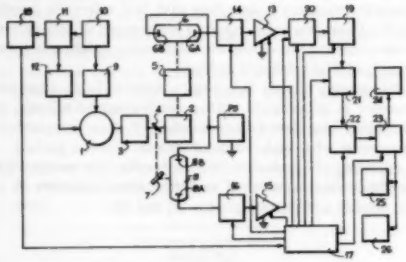
Michael A. Ford, Maidenhead, and Brian B. Leather, Beaconsfield, both of England, assignors to Perkin-Elmer Limited, Buckinghamshire, England

Filed Apr. 29, 1982, Ser. No. 373,072

Claims priority, application United Kingdom, May 5, 1981, 8113636

Int. Cl.³ G01N *21/64*

U.S. Cl. 250—459.1 **15 Claims**



1. A method of flash spectrofluorimetry comprising the steps of:

(a) subjecting a sample under analysis to a succession of high-intensity flashes of exciting radiation arranged to provide a near continuum in the spectrofluorimetric region of interest and allowing a dwell between consecutive flashes that is at least one order of magnitude greater than the duration of a single flash;

(b) deriving through fluorescence measuring means an electrical output signal in response to the fluorescence excited in the sample by each flash, substantially the whole of said output signal occuring in a first time interval that includes a flash duration and representing a composite signal in that it includes a spurious contribution due to standing current in said fluorescence measuring means;

(c) obtaining a first integral by integrating the composite signal during said first time interval;

(d) disabling the spurious output of the fluorescence measuring means during the dwell period, except for a second time interval substantially equal to the first;

(e) sampling said spurious output during the second time interval;

(f) obtaining a second integral by integrating the sampled spurious output during said second time interval; and

(g) subtracting the second integral from the first to obtain the integral of the true fluorescence measuring signal substantially free from said spurious contribution.

4,438,330

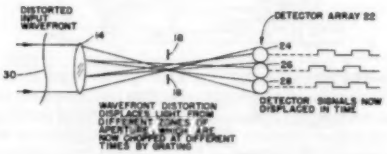
WAVEFRONT SENSOR EMPLOYING A MODULATION RETICLE

John W. Hardy, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 1, 1982, Ser. No. 353,554

Int. Cl.³ G01U *1/20*

U.S. Cl. 250—201 **11 Claims**


DISTORTED INPUT WAVEFRONT
DETECTOR ARRAY 22
WAVEFRONT DISTORTION DISPLACES LIGHT FROM DIFFERENT ZONES OF APERTURE SO THAT IT IS NOW CHOPPED AT DIFFERENT TIMES BY GRATING
DETECTOR SIGNALS NOW DISPLACED IN TIME

1. A relatively simple two-dimensional wavefront sensor, comprising:

a. an optical system for focusing an incident wavefront to a focal point;

b. a modulation reticle positioned substantially at said focal point, and a drive means for driving the modulation reticle in linear oscillation along a single axis, said modulation reticle having a modulation pattern thereon in which at least one light transmissive area and at least one light opaque area thereon is separated by at least two oblique, relative to said single axis, lines of demarcation such that the precise time of modulation of light at the focal point is dependent upon both the x and y position of the light with respect to the oblique line of demarcation; and

c. a first detector means for detecting the wavefront, which has passed through said transmissive area and expanded from said focal point, at a two dimensional array of zones in the expanded wavefront and for producing an output signal indicative of the light detected in each zone.

4,438,331

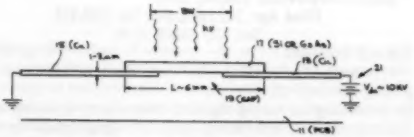
BULK SEMICONDUCTOR SWITCH

Steven J. Davis, Hayward, Calif., assignor to Power Spectra, Inc., Fremont, Calif.

Filed Dec. 2, 1981, Ser. No. 326,683

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—211 J **7 Claims**



1. Apparatus for switching kilovolt magnitude voltages in times of the order of one nanosecond or less, the apparatus comprising:

a block of electrical insulating material;

two microstrips of electrically conducting material of thick-

ness 1–3 μm, collinearly positioned and spaced apart from one another by a gap of 1–3 mm, both microstrips being mounted on one side of the insulating material block;

a substantially rectangular block of solid semiconductor material having a length of at least twice the length of the microstrip gap and being doped with boron at a concentration of between $10^{15}/cm^3$ and $10^{18}/cm^3$, with the semiconductor block being maintained in electrical contact with the two microstrips and lying across the microstrip gap;

a voltage source electrically connected to the two microstrips to impress a substantially constant voltage of at least 5 KV between the microstrips;

cryogenic cooling means adjacent to the semiconductor block for cooling the block to a temperature $T \leq 230°$ K.; and

a source of pulsed radiation producing a radiative beam output of 10–100 nanojoules, the radiation beam being directed at the microstrip gap and the semiconductor block lying between the microstrip gap and the pulsed radiation source.

4,438,332

DETECTOR FOR AN ELECTRON MICROSCOPE

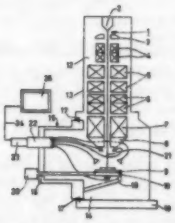
Siegried Lichtenegger, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 308,732, Oct. 5, 1981, abandoned, which is a continuation of Ser. No. 137,865, Apr. 7, 1980, abandoned. This application Feb. 9, 1983, Ser. No. 465,087

Claims priority, application Netherlands, Apr. 13, 1979, 7902963

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—310 **11 Claims**



1. An electron microscope comprising:

first means for generating an electron beam, second means for providing a specimen in alignment with said electron beam, and detection means for detecting radiation occurring from interaction between said specimen and said electron beam, said detection means comprising:

a plurality of separated detector elements for detecting different types of radiation placed in surrounding location about said specimen, each of said detector elements including at least one flexible optical conductor having a light funnel with a first larger end facing said specimen and said light funnel being integral with said optical conductor, and an entrance screen sensitive to radiation to be detected and positioned at said first larger end, said entrance screen including a luminescent layer facing said specimen and a reflector layer overlying said luminescent layer, said luminescent layer and said reflector layer being deposited on an entrance side of said light funnel facing said specimen,

a radiation passage structure serving as a wall seal optically coupled at ends remote from said specimen to all of said optical conductors for each of said detector elements, said radiation passage structure being an optically transmissive material of high refractive index, and

means responsive to at least one of said detector elements for enabling display of information from said specimen, including an adjustable diaphragm means which is separately connected to said radiation passage structure for detecting at least one radiation conductive signal from the plurality of detector elements.

4,438,333

NOISE ERASING APPARATUS FOR STIMULABLE PHOSPHOR SHEET

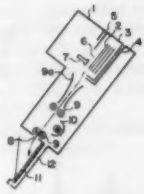
Masanori Teraoka; Takao Komaki, and Seiji Matsumoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1982, Ser. No. 339,795

Claims priority, application Japan, Jan. 16, 1981, 56-4889

Int. Cl.³ G01T *1/11*

U.S. Cl. 250—327.2 **12 Claims**



1. In an arrangement wherein stimulable phosphor sheets for use in a radiation image recording and reproducing system are taken up one at a time out of a stimulable phosphor sheet reservoir containing stimulable phosphor sheets and each is loaded into a cassette used for the recording of a radiation image,

a noise erasing apparatus for stimulable phosphor sheets comprising an irradiation means for emitting noise erasing light, which is provided between the aperture of said stimulable phosphor sheet reservoir from which said stimulable phosphor sheets are taken up and the section at which said stimulable phosphor sheets are loaded into said cassettes.

4,438,334

GAMMA CAMERA COMPRISING A LOCALIZING SCINTILLATION INTENSIFIER

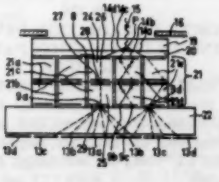
Michel Jatteau, Lesigny; Pierre H. Lelong, Gentilly, and Jean Pergrale, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,015

Claims priority, application France, Apr. 29, 1980, 80 09669

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—363 S **10 Claims**



1. In a gamma camera which comprises: a scintillation crystal; a protecting window which is transparent to scintillation radiation produced in the crystal disposed adjacent said crystal; a light intensifier for receiving scintillation light from said crystal through said window; an optical guide for scattering light from the intensifier; and a scintillation localizer, comprising an array of photodetectors having input faces directed toward the optical guide; the improvement wherein said light intensifier comprises a mosaic of juxtaposed, identical intensi-

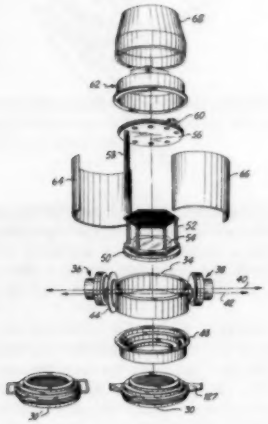
fier modules, each having a magnification of approximately one, and each of said modules comprising a photocathode disposed adjacent the scintillation crystal and a screen disposed adjacent the optical guide, wherein each module of the intensifier is a proximity focussed diode tube, and wherein the localizer comprises a network of photomultipliers.

4,438,335

DETECTOR HEAD MOUNTING APPARATUS

Raymond L. Meeder, Palos Heights, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Sep. 2, 1981, Ser. No. 298,635
Int. Cl.³ G01T *1/20*; G21K *1/02*
U.S. Cl. 250—363 S **4 Claims**



1. Apparatus for pivotally mounting a detector head including a collimator onto supporting structure of a radiation detector comprising:

means for mounting the head onto the supporting structure for rotation about a selected one of a first trunnion axis and a second trunnion axis; and

means for selecting the axis about which the detector head can rotate whereby the head will be rotatable about the axis which passes nearest to the center of gravity of the head;

wherein the axis selecting means is activated by the weight of the collimator.

4,438,336

CORPUSCULAR RADIATION DEVICE FOR PRODUCING AN IRRADIATION PATTERN ON A WORKPIECE

Wolfgang D. Riecke, Baden.Baden, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,339
Int. Cl.³ H01J *37/147, 37/26, 37/30*
U.S. Cl. 250—398 **18 Claims**

1. A corpuscular radiation device for producing an irradiation pattern on a workpiece comprising:

(a) means for adjustably supporting a workpiece having opposed major surfaces, and at least one partially irradiatable object and a free beam passage opening;

(b) a first radiation source spaced from one of said surfaces of said workpiece for emitting a first beam;

(c) a first corpuscular-optical condenser lens system for directing said first beam in one direction along a path towards said one surface of said workpiece;

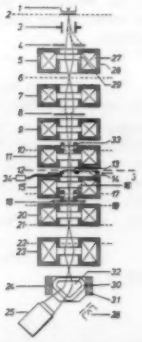
(d) a second radiation source spaced from the other of said surfaces of said workpiece for emitting a second beam;

(e) a second corpuscular-optical lens system for directing said second beam in the direction opposite said first direction along said path towards said other surface of said workpiece;

(f) an image receiver with a receiver surface;

(g) said second radiation source and said image receiver being arranged adjacent said path on the side of said second corpuscular optical lens system remote from said workpiece supporting means; and

(h) a beam switch arranged in said path and between said second radiation source and said image receiver on the one hand and said second corpuscular-optical lens system on the other hand for interlacing said first and second beams along said path;



(i) said second corpuscular-optical lens system being adapted to function as an electron microscope system for directing said first beam towards said receiving surface of said image receiver and to function as an electron scan microscope for directing said second beam towards said first radiation source; and

(j) said beam switch being adapted to deflect the beam produced by the first radiation source so that the corpuscular microscopic image drafted by the second corpuscular optical lens system is incident upon the receiver surface of the image receiver; and

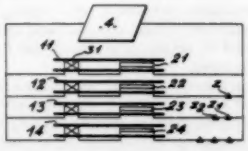
(k) said beam switch also being adapted to deflect the beam produced by the second radiation source to the axis of the second corpuscular lens system.

4,438,337

APPARATUS FOR THE PURIFICATION OF WATER BY ULTRAVIOLET RADIATION

Francis Forrat, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 12, 1982, Ser. No. 348,211
Claims priority, application France, Feb. 26, 1981, 81 03834
Int. Cl.³ G01N *21/01*
U.S. Cl. 250—436 **4 Claims**



1. An apparatus for the purification of water, wherein it

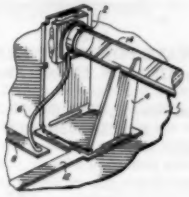
comprises at least one pipe traversed by the liquid to be purified, said pipe having at least one ultraviolet lamp and an electrovalve electrically connected in series with the lamp and placed upstream of the latter, the resistance of the electrovalve being substantially equal to the load impedance of the lamp, wherein the apparatus further comprises a plurality of pipes transversed by the liquid to be purified, the lamp-electrovalve assemblies of each pipe being electrically connected in parallel, and the assembly being supplied with a power by a single solar cell collector.

4,438,338

LOW PROFILE OPTICAL COUPLING FOR AN OPTOELECTRONIC MODULE

Robert M. Stitt, and Neil P. Albaugh, both of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Nov. 5, 1981, Ser. No. 318,475
Int. Cl.³ G02F 1/28
U.S. Cl. 250—551 **7 Claims**



1. A fiber optic module comprising a substrate bearing conductive surface portions parallel to a first plane, an optical fiber, and an optoelectronic device located substantially orthogonal to said first plane comprising two electrodes and having a planar light-coupling surface portion coupled to said optical fiber;

one of said conductive surface portions of said substrate being electrically connectable to a signal processing circuit mounted on said substrate;

first flexible conductive means for providing an electrical connection to said one of said conductive surface portions;

metal deformable device mounting means including a first portion substantially parallel with said first plane and a second movable portion substantially orthogonal to said first plane for providing optical alignment and mechanical support for and electrical contact to said optoelectronic device; and

second flexible conductive means of the same type as said first flexible conductive means attached to one of said electrodes of said optoelectronic device for electrically coupling said electrode to one of said conductive surface portions, said second flexible conductive means being attached to said optoelectronic device when its planar light-coupling surface portion is substantially orthogonal to said first plane.

4,438,339

LOW AXIAL STIFFNESS THRUST BEARING

James D. McHugh, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 164,071, Jun. 30, 1980, Pat. No. 4,325,583. This application Dec. 24, 1981, Ser. No. 334,171
Int. Cl.³ F16C 32/06, 7/04
U.S. Cl. 290—1 R **7 Claims**

1. A turbine-generator set comprising:

a gas turbine;

said gas turbine including a drive shaft supported by radial bearings;

a generator;

said generator including a central shaft supported by other radial bearings;

a clutch mechanism effective for coupling said drive shaft and said central shaft;

a thrust bearing on said drive shaft effective for generally aligning said drive shaft;

a low axial stiffness thrust bearing on said central shaft;

said low axial stiffness thrust bearing including means for permitting an axial float of said central shaft sufficient to axially align said central shaft when said clutch mechanism is disengaged and to prevent the development of destructive axial force due to thermal expansion of said drive shaft and said generator when said clutch mechanism is engaged;

said low axial stiffness thrust bearing including a housing having a generally cylindrical space formed therein;

a generally cylindrical thrust collar located coaxially within said cylindrical space, an axial length of said cylindrical space being substantially greater than an axial length of said thrust collar whereby first and second fluid chambers are disposed in said cylindrical space at opposite sides of said thrust collar, said thrust collar being axially movable within said cylindrical space over a predetermined distance; and

fluid circuit means for supplying fluid under pressure to said first and said second fluid chambers;

said fluid circuit means including means for urging said thrust collar toward a predetermined axial location within said cylindrical space.

7. A turbine-generator set comprising:

a gas turbine;

said gas turbine including a drive shaft supported by radial bearings;

a generator;

said generator including a central shaft supported by other radial bearings;

a clutch mechanism effective for coupling said drive shaft and said central shaft;

a thrust bearing on said drive shaft effective for generally aligning said drive shaft;

a low axial stiffness thrust bearing on said central shaft; and

said low axial stiffness thrust bearing including means for permitting an axial float of said central shaft sufficient to axially align said central shaft when said clutch mechanism is disengaged and to prevent the development of destructive axial force due to thermal expansion of said drive shaft and said generator when said clutch mechanism is engaged.

4,438,340

DOMESTIC ELECTRIC GENERATOR AND STEAM HEATING PLANT

Dennis L. Armiger, 94 Chautauqua Rd., Arnold, Md. 21012

Continuation-in-part of Ser. No. 286,989, Jul. 27, 1981, abandoned. This application Nov. 5, 1981, Ser. No. 318,420
Int. Cl.³ F01K 17/02, 17/06
U.S. Cl. 290—2 **11 Claims**

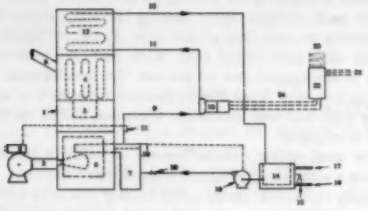
1. A method of generating heat and electricity for building use comprising:

(a) providing a furnace having a plenum chamber with a combustion chamber therein, said furnace generating hot air;

(b) placing a steam generating boiler in said combustion chamber;

(c) connecting a turbine to said boiler, passing the steam

from said turbine through coils in said plenum chamber in said furnace to supply a secondary heating source;
(d) said turbine driving an electric generator; and

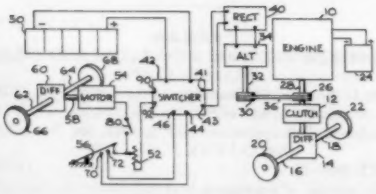


(e) feeding electricity from said generator into the building's electrical service.

4,438,341
METHOD OF AN APPARATUS FOR VARYING THE LOAD ON AN A.C. GENERATOR
Harold Winterbotham, Fern Howe, Braithwaite, Keswick, Cumbria, England (CA12)
Filed Jan. 29, 1982, Ser. No. 343,882
Int. Cl.³ H02P *5/40*
U.S. Cl. 290—44 **9 Claims**

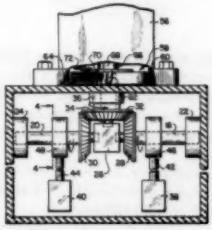
1. A method of varying the load on an A.C. generator in accordance with the speed of rotation thereof, including the steps of: detecting the period of each half cycle of the generator; calculating the percentage of conduction required in each half cycle in accordance with a predetermined law which relates the load to the speed of rotation; and gating the current flow to the load in each following half cycle in accordance with the percentage of conduction calculated.

4,438,342
NOVEL HYBRID ELECTRIC VEHICLE
Keith E. Kenyon, 14435 Hamlin St., Van Nuys, Calif. 91401
Continuation of Ser. No. 149,978, May 15, 1980, abandoned. This application May 1, 1981, Ser. No. 259,518
Int. Cl.³ B60L *11/12*
U.S. Cl. 290—45 **9 Claims**



1. A hybrid heat-engine, electrical motor power plant, including:
a heat engine having a first output shaft;
an electrical motor having input terminals for connection to a source of electrical power and having a second output shaft for coupling to a mechanical load;
an electrical alternator having electrical output terminals and an input shaft mechanically coupled to said first output shaft for driving said alternator from said heat engine;
rectifying means electrically coupled to said electrical output terminals of said alternator and responsive to alternating current from said alternator to produce direct current;
battery means having power terminals;
switcher means having first input terminals coupled to said rectifying means, second input terminals coupled to said power terminals of said battery means and output terminals;
coupling means for coupling said output terminals of said switcher means to said input terminals of said electrical motor;
switcher control means coupled to said switcher and responsive to the activation thereof to selectively connect said battery means and said rectifying means in a predetermined electrical mode across said output terminals of said switcher means;
said electrical alternator having no elemental iron in its magnetic circuit.

4,438,343
WAVE POWER GENERATOR
John P. Marken, 525-149 W. El Norte Pkwy., Escondido, Calif. 92026
Filed Nov. 12, 1982, Ser. No. 440,968
Int. Cl.³ F03B *13/12*
U.S. Cl. 290—53 **8 Claims**



1. An apparatus for converting the pitch and roll motions of a floating marine body into mechanical energy, comprising:
a housing having means defining a fixed horizontal oscillatory axis, said housing adapted for mounting on a buoyant structure for floating on a body of water;
a first input shaft and a second input shaft coaxially mounted in said housing and including unidirectional coupling means for constraining said first and second shafts for counter rotation about said oscillatory axis;
first counterweight means mounted eccentrically on said first shaft and including means for restraining rotation of said shaft relative thereto in a first direction;
second counterweight means mounted eccentrically on said second shaft and including means for restraining rotation of said shaft relative thereto in a second direction; and
an output shaft drivingly connected connected to both said first and second input shafts for unidirectional rotation upon oscillatory motion of either one of said housing and said counterweights.

4,438,344
SWITCHED RECTIFIER DISC FOR EDISON SOCKETS
Donald Albert, Higganum, and Anthony M. Tremaglio, Waterbury, both of Conn., assignors to Miracle Products, Inc., Middlebury, Conn.
Filed May 25, 1982, Ser. No. 381,957
Int. Cl.³ H02J *1/00;* **H05B** *37/02*
U.S. Cl. 307—146 **20 Claims**

1. A switching device insertable into a current carrying light

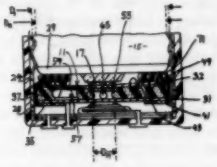
bulb socket, such as an Edison socket, below a light bulb for providing the bulb with attenuated power in a first mode and with full power in a second mode comprising:

(a) first and second electrically conductive planar contacts;

(b) an insulative spacer separating the first and second planar contacts, the insulative spacer being at least partially composed of elastomeric material;

(c) a means to secure the first and second planar contacts to the insulative spacer;

(d) a diode disposed between the first and second planar contacts so that, in the first mode, the diode is electrically in series with the planar contacts and all of said current passes through said diode; and



(e) a pressure switching arrangement connected in series with the planar contacts and including switch means, whereby when the planar contacts are not compressed together, said switch means remains open and said first mode is established, and the switching arrangement closes when the planar contacts are compressed against the insulative spacer by a predetermined amount thereby closing said switch means to establish direct electrical continuity between the planar contacts, thereby providing two paths for said current to simutaneously take, one said path including said diode and another said path bypassing said diode, thereby establishing said second mode.

4,438,345

TRANSISTOR PULSE DRIVE CONTROL CIRCUIT

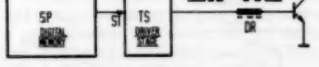
Rainer Dangschat, Landsham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,719

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1980, 3030322

Int. Cl.³ H03K *3/26, 3/33*

U.S. Cl. 307—270 **10 Claims**



1. Electronic control circuit for the horizontal deflection of a television set and for controlling a switched circuit element, including an output transistor for furnishing the output current of the control circuit and having a control electrode being addressed by at least one control signal producing a time-variable current through the control electrode, comprising a programmed digital memory delivering a series of pulses and generating the control signals for driving the control electrode of the output transistor, and a choke connected between said memory and the control electrode of the output transistor for carrying the control signals to the output transistor, said memory being binary programmed in such a manner that the control signals are formed from the series of pulses delivered by said memory and by said choke with a waveform required for controlling the output transistor without the use of a digital to analog converter.

4,438,346

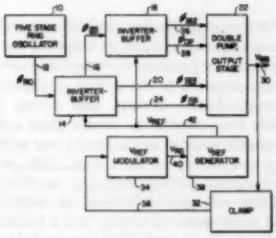
REGULATED SUBSTRATE BIAS GENERATOR FOR RANDOM ACCESS MEMORY

Patrick T. Chuang, Cupertino; Paul D. Keswick, San Jose, and Jeffrey L. Linden, Sr., Sunnyvale, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 15, 1981, Ser. No. 311,589

Int. Cl.³ H03L *1/00;* **H03K** *3/017*

U.S. Cl. 307—297 **17 Claims**



1. A regulated substrate bias generator for use in a capacitive charge storage integrated circuit memory device formed on a semiconductor substrate and having an external voltage supply, said generator comprising;

a. means for generating first and second timing signals;

b. charge pumping means disposed for pumping charge from said substrate in response to said first and second timing signals, and for generating an output bias voltage on an output terminal thereof;

c. voltage regulation means disposed between said output terminal of said charge pumping means and reference potential input terminals of said means for generating, said voltage regulation means being disposed for providing a reference potential on an output terminal thereof that regulates the amount of charge pumped from said substrate as a function of the magnitude of the generated bias voltage;

said voltage regulation means including:

d. voltage clamp circuit means disposed for clamping said generated bias voltage to a limited negative value, said voltage clamp circuit means having an input terminal coupled to the output of said charge pumping means and an output terminal;

e. a modulator circuit means having an input terminal coupled to said output terminal of said voltage clamp circuit means, and an output terminal; and,

f. a generator circuit means having an input terminal coupled to said output terminal of said modulator circuit means, and an output terminal coupled to reference voltage input terminals of said means for generating, said generator circuit means being disposed for supplying said reference potential in response to the output of said voltage clamp circuit means as modified by said modulator circuit means.

4,438,347

DEVICE FOR CHANGING THE ELECTRICAL CIRCUIT CONFIGURATION OF INTEGRATED SEMICONDUCTOR CIRCUITS

Gerhard Gehring, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,112
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030620
Int. Cl.³ H01L 27/01; H03H 2/00
U.S. Cl. 307—308 5 Claims

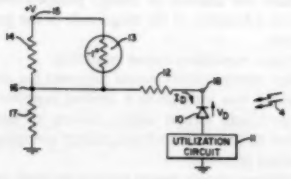
1. Device for changing the electrical circuit configuration of integrated semiconductor circuits on chips for the adjustment and trimming of circuit parameters, comprising circuit connections selectively disposed in the circuit configuration of the integrated semiconductor circuits, said circuit connections being accessible from outside the circuit chips and being mechanically openable without mechanically and without electrically stressing and modifying the circuit chips, an integrated semiconductor circuit having electrical interference signals caused by stored mechanical stresses, an evaluation circuit following said semiconductor circuit, and a balancing resistor network disposed in said evaluation circuit, said circuit connections being in the form of bridges connected to resistors of said resistor network and being mechanically openable for selectively adjusting resistance values of said resistor network and compensating said interference signals.

4,438,348

TEMPERATURE COMPENSATED AVALANCHE PHOTODIODE OPTICAL RECEIVER CIRCUIT

Paul W. Casper, Melbourne, and William B. Ashley, Indialantic, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Oct. 6, 1978, Ser. No. 949,231
Int. Cl.³ H03K 3/42; H01J 7/24
U.S. Cl. 307—310 13 Claims



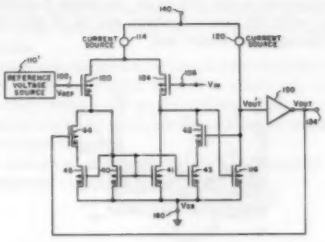
1. An avalanche photodiode circuit comprising:
an avalanche photodiode for receiving a light signal and generating an electrical output in response thereto;
a thermistor-containing voltage divider network; and
a first resistor; and wherein
said voltage divider network is electrically separated from said avalanche photodiode except for said first resistor which is connected therebetween.

4,438,349

HYSTERESIS CIRCUIT HAVING A STABLE OUTPUT FREE FROM NOISE SUPERPOSED ON INPUT SIGNAL

Masashi Shoji, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1981, Ser. No. 315,537
Claims priority, application Japan, Oct. 29, 1980, 55-151796
Int. Cl.³ H03K 5/24, 5/153
U.S. Cl. 307—362 15 Claims



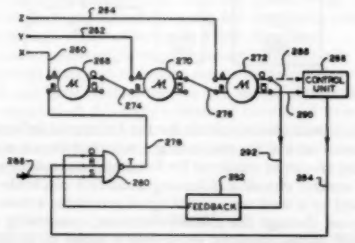
1. A comparator comprising first and second input terminals, an output terminal, a first transistor having a control electrode connected to the first input terminal, a second transistor having a control electrode connected to the second input terminal, said first and second transistors being interconnected to form a differential amplifier, a first load connected to the first transistor, a second load connected to the second transistor, a phase-inverter, means for supplying an output of said differential amplifier to said phase-inverter, first switching means for establishing a first conduction path in parallel with said first load, said first switching means being controlled by an output of said phase-inverter, second switching means for establishing a second conduction path in parallel with said second load, said second switching means being controlled by an input to said phase-inverter, and means for coupling the output of said phase-inverter to said output terminal.

4,438,350

LOGIC CIRCUIT BUILDING BLOCK AND SYSTEMS CONSTRUCTED FROM SAME

Joseph J. Shepter, New Haven, Conn., assignor to Scientific Circuitry, Inc., Conn.

Division of Ser. No. 852,594, Nov. 17, 1977, Pat. No. 4,257,008, which is a division of Ser. No. 382,981, Jul. 26, 1973, abandoned.
This application Feb. 18, 1981, Ser. No. 235,635
Int. Cl.³ H03K 19/00
U.S. Cl. 307—440 10 Claims



1. A logic system which includes a plurality of identical logic circuit building blocks, each referred to as an M Circuit, said system comprising:
a plurality of M Circuits each of which responds to transitions of a two level, binary input signal to provide a memory and a logic function which has a complete truth table

for every possible combination of input signal transitions or changes in logic level at a pair of input terminals A and B, each of said M Circuits comprising gating means having two inputs connected to said A and B input terminals, respectively, and a set-reset flip-flop means having its set input connected to the output of said gating means, its reset input connected to said B input terminal and its set and reset outputs connected respectively to output terminals Q and $\overline{Q}$ of said M Circuit, said Q and $\overline{Q}$ output terminals providing complementary binary outputs for any combination of binary inputs applied at said A and B input terminals, whereby said M Circuit is a four terminal device which responds to each transition of said input signal at said A and B terminals to provide outputs at said Q and $\overline{Q}$ terminals in accordance with its truth table function, said plurality of M Circuits being connected in a linear array for processing serial or parallel data received on a plurality of N input lines, said plurality of M Circuits being equal in number to said plurality of N input lines, each of said M Circuits having its A input terminal coupled to one of said input lines, with the B input of the first M Circuit in the linear array being coupled to a reset line and individual means connecting each of the B inputs of the second and remaining M Circuits to an output terminal of the preceding M Circuit, whereby the last M Circuit in said linear array will be activated when an input has occurred on each of said input lines to thereby provide an output signal.

4,438,351

GALLIUM ARSENIDE MIS INTEGRATED CIRCUITS

Fritz L. Schuermeyer, 1759 Southview Dr., Yellow Springs, Ohio 45387

Filed Jun. 9, 1981, Ser. No. 271,754

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.³ H03K *17/687, 3/356, 19/00*

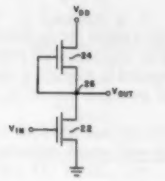
U.S. Cl. 307—450 **5 Claims**

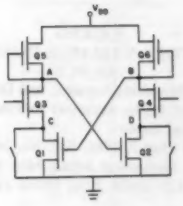
1. An integrated circuit using metal insulator semiconductor field effect transistors (MISFET) of the buried channel type in which the semiconductor comprises an active layer of gallium arsenide (GaAs), each transistor having a source, a drain, and at least one gate, with a gate insulator of a material which provides large interface trap states, the region of the active layer under the gate having a doping and being of sufficient thickness so that when there is a direct connection between the source and gate providing zero direct-current bias a depletion layer extends only partly through said region and the transistor is therefore conducting, said integrated circuit comprising:

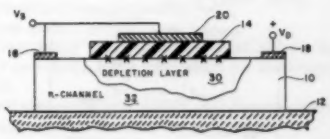
at least one inverter circuit with load means and an active transistor in series across a direct current bias supply with a node between them, the drain and source of the active transistor being coupled to said node and to a terminal of said bias supply respectively, an input connection to the gate of the active transistor, means to electrically set a threshold voltage for bias at the gate of the active transistor via said interface trap states, and to maintain said threshold voltage by signals above a cutoff frequency at said input connection which may vary between a given high level substantially equal to the bias potential at said source such that an initial high-level signal charges said interface trap states and the internal between high-level signals is sufficiently short to maintain the charge.

2. An integrated circuit using metal insulator semiconductor field effect transistors (MISFET) of the buried channel type having large interface trap states in which the semiconductor is gallium arsenide (GaAs), each transistor having a source, a drain, and at least one gate, said integrated circuit comprising:

two inverter circuits, each inverter circuit having load means and an active transistor in series across a direct current bias supply with a node between them, the drain and source of the active transistor being coupled to said node and to a terminal of said bias supply respectively, an input connection to the gate of the active transistor, means to electrically set a threshold voltage for bias at the gate of the active transistor via said interface trap states, and to maintain said threshold voltage by signals above a cutoff frequency at said input connection which vary between a given high level substantially equal to the bias potential at said source such that an initial high-level signal charges







said interface trap states and that interval between high-level signals is sufficiently short to maintain the charge:

wherein said inverter circuits are connected as two branches of a latch, with direct cross coupling from said node of each branch to the gate of the active transistor of the other branch.

4,438,352

TTL COMPATIBLE CMOS INPUT BUFFER

Michael M. Mardkha, Santa Monica, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 155,721, Jun. 2, 1980, abandoned. This application Aug. 17, 1982, Ser. No. 408,579

Int. Cl.³ H03K *19/003, 19/092, 19/094, 5/02*

U.S. Cl. 307—475 **3 Claims**

1. A TTL compatible CMOS input buffer for converting an input signal at TTL levels to an output signal at CMOS levels comprising:

a transmission gate coupled to receive said input signal and having a high impedance during input level transitions and a low impedance during steady high and low input signal conditions,

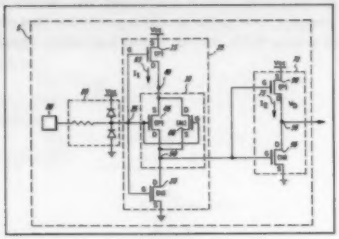
a first transistor connected between said transmission gate and the power supply,

a second transistor connected between said transmission gate and ground,

the gates of said first and second transistors connected to said input, and

third and fourth transistors connected in series between the power supply and ground, the gates of said third and

fourth transistors connected to the connection between said second transistor and said transmission gate, the out-



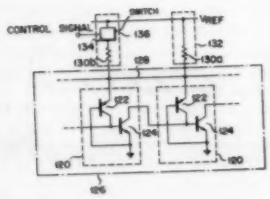
put point of the buffer being the connection point between said third and fourth transistors.

4,438,353

I²L CIRCUIT WITH A VARIABLE INJECTOR CURRENT SOURCE

Jun Sano, Tokyo; Masahide Aoyama, and Daijiro Kubo, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 7, 1981, Ser. No. 261,617
Claims priority, application Japan, May 14, 1980, 55-63641
Int. Cl.³ H03L 5/00; H03K 19/091
U.S. Cl. 307—477 **16 Claims**



1. An I²L logic circuit comprising:

a logic section including at least one I²L unit circuit with a transistor for injector and a driving transistor; and

supply means for supplying said I²L unit circuit with an injector current in response to a control signal which is a function of a desired operating speed of said I²L unit circuit, said injector current always being large enough to operate said I²L unit circuit.

4,438,354

MONOLITHIC PROGRAMMABLE GAIN-INTEGRATOR STAGE

Yusuf A. Haque, San Jose; Vikram Saletore, Cupertino, and Jeffrey A. Schuler, Saratoga, all of Calif., assignors to American Microsystems, Incorporated, Santa Clara, Calif.

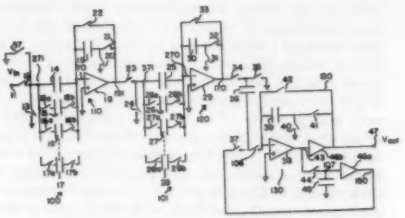
Filed Aug. 14, 1981, Ser. No. 292,870
Int. Cl.³ H03G 3/00; H03K 5/00; G06G 7/18
U.S. Cl. 307—493 **10 Claims**

1. An electronic gain-integrator stage having an input terminal for receiving an input signal and having an output terminal, comprising:

M operational amplifier gain stages connected in series where M is a selected integer varying from 1 to K, where K is the maximum number of gain stages, said M operational amplifier gain stages each having a programmable gain and an inherent offset voltage and said Mth gain stage having an output lead which provides an output signal which includes an error component which is a function of said offset voltages of said M operational amplifier gain stages;

an operational amplifier integrator stage connected to said gain stages, having an inherent offset voltage, and including

means for integrating during the first half of a selected cycle the negative of said error component, which is produced in response to the initialization of said M gain stages, and integrating during the second half of said selected cycle both the positive of said error component, which is pro-



duced in response to said input signal, and the positive of said input signal multiplied by each of said programmable gains of each of said M gain stages;

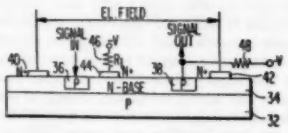
wherein the negative of said error component is integrated once for each integration of the input signal, whereby the effects of said offset voltages of each of said M gain stages are eliminated.

4,438,355

PHASE CANCELLER FOR CARRIER RECOVERY NETWORK

Vasil Uzunoglu, Ellicott City, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Division of Ser. No. 134,735, Mar. 27, 1980, Pat. No. 4,368,542. This application May 6, 1982, Ser. No. 375,603
Int. Cl.³ H03K 5/153, 3/26
U.S. Cl. 307—511 **6 Claims**



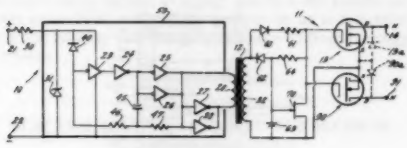
1. Apparatus for cancelling phase shifts in a signal having frequency variations and associated phase shifts comprising, a substrate formed of a first type of semi conductor material, a base region formed of a second semiconductor material adjacent to said first semiconductor material, a pair of junctions formed in said base region, one of said junctions receiving said signal and acting as an emitter of minority carriers in said base region, the other of said junctions acting as a collector, and a pair of ohmic contacts on said second semiconductor material and disposed on opposite sides of said respective emitter and collector junctions wherein an applied electric field between said ohmic contacts caused emitted minority carriers injected into said base at said emitter junction to drift toward said collector at a controlled rate determined by said applied electric field to vary the phase shift of said signal across said apparatus.

4,438,356

SOLID STATE RELAY CIRCUIT EMPLOYING MOSFET POWER SWITCHING DEVICES

Kenneth H. Fleischer, Los Angeles, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Mar. 24, 1982, Ser. No. 361,184
Int. Cl.³ H03K 17/687
U.S. Cl. 307—571 18 Claims



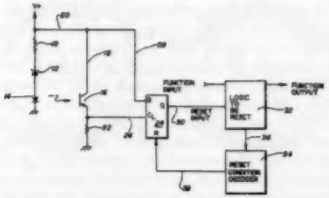
1. A solid state relay employing a MOSFET device as its power switching element; said solid state relay comprising an input circuit for receiving low voltage, low power input switching signals which vary between an on value and an off value; an oscillator circuit connected to said input circuit for producing a relatively high frequency output in response to said on value switching signal; a control circuit for applying and removing gate voltage to said MOSFET device and coupling means for coupling said control circuit to said high frequency output; said control circuit including control transistor means connected to the gate of said MOSFET device and operable to discharge the gate capacitance of said MOSFET device when said control transistor means is conductive; capacitance means coupled between the gate of said control transistor means and said coupling means for rendering said control transistor means nonconductive in the presence of an output from said coupling means; and circuit means including a diode directly connecting the output of said coupling means to the gate of said MOSFET device and to said control transistor means, whereby said circuit means including said diode can cause charging of the gate capacitance of said MOSFET device only when said control transistor is nonconductive.

4,438,357

LEVEL SENSITIVE RESET CIRCUIT FOR DIGITAL LOGIC

Michael F. Wicnienski, Antioch, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 17, 1982, Ser. No. 389,429
Int. Cl.³ H03K 17/28
U.S. Cl. 307—597 18 Claims



1. A system for resetting a digital logic circuit, which comprises:

a switch operable to provide a first signal when a predetermined condition has occurred;

a bistable device operable to receive said first signal and to provide an output reset signal when the device is in a first state, in response to said first signal;

a digital logic circuit to be reset coupled to the output of the bistable device for receiving the output reset signal;

feedback means coupled from said digital logic circuit back to said bistable device for sensing the state of the digital logic circuit and for switching the bistable device into a second state only when said logic circuit is in its reset condition whereby said output reset signal is terminated;

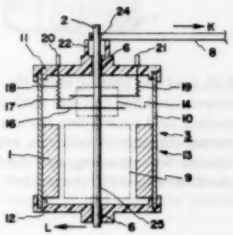
whereby a functional output from the digital logic circuit is prevented unless the digital logic circuit is in its reset condition when the system is activated.

4,438,358

MEANS FOR SUPPRESSING VIBRATION AND NOISE IN A DEVICE DRIVEN BY A SMALL ELECTRIC MOTOR

Yutaka Shiseki; Junichi Yagi, both of Kanagawa, and Yasuyuki Miura, Tokyo, all of Japan, assignors to Ozen Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,755
Claims priority, application Japan, Nov. 21, 1977, 52-139605
Int. Cl.³ H02K 5/24
U.S. Cl. 310—51 19 Claims



1. An electric motor comprising:

an output shaft;

said motor being provided with a field magnet having a north pole and a south pole which are diametrically opposed;

said shaft supporting an armature and extending transversely through the field provided by said poles;

means urging said shaft in a direction diametrically transverse to a line connecting said north and south poles of said field magnet whereby vibration of said shaft is suppressed;

the angle between the direction of said means urging said shaft and said line connecting said north pole and said south pole lies in the range of from 30° to 90°; and

the direction of the said means urging the output shaft is normal to said line connecting said north and south poles.

4,438,359

DYNAMOELECTRIC MACHINE STRUCTURE AND METHOD

Neal B. Royer, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 14, 1982, Ser. No. 368,397
Int. Cl.³ H02K 11/00
U.S. Cl. 310—68 R 12 Claims

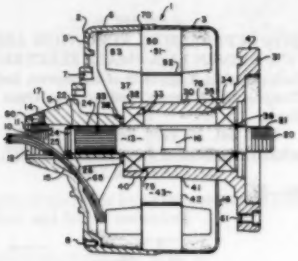
1. A dynamoelectric machine for a ceiling fan, comprising:

an end shield having an axial opening in it;

a shaft having a bore through it immovably mounted in the axial opening of said end shield, said shaft having a first end and a second end, the first end of said shaft being attached to said end shield and said second end including means for mounting at least one additional device to said shaft, said hollow bore permitting electrification of said additional device;

a stator assembly mounted to said end shield and independently supported thereby, said stator assembly including a core of magnetic material having a central opening through it defining a bore, a plurality of winding receiving slots opening on said bore, and windings in said slots;

a rotor assembly mounted on said shaft and rotatable with respect thereto, said rotor assembly including a rotor having an axial opening in it, and a hub having an axial opening through it, said hub including an external diameter and an internal diameter, a first bearing positioned along the axial opening in said hub between said hub and



said shaft, a second bearing along the axial opening in said hub between said hub and said shaft and spaced from said first bearing, said rotor being mounted to said hub along the external diameter of said hub; and

retainer means for mounting said rotor assembly on said shaft positioned near the second end of said shaft.

4,438,360

DRIVING DEVICE FOR EFFECTING LINEAR MOTION

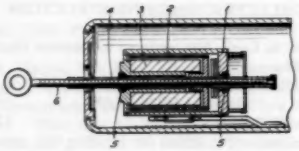
Kurt Held, Alte Str. 1, D-7728 Trossingen 2, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,138

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114591

Int. Cl.³ H02K 7/06

U.S. Cl. 310—83 **1 Claim**



1. An electrically operated driving device for effecting linear motion using an electric motor, comprising a non-ferrous bell-type armature having an axially extending hollow armature shaft with an internal thread, an elongated threaded spindle extending through and in threaded engagement with said hollow shaft and said threaded spindle being axially displaceable relative to said hollow armature shaft when said shaft is rotated.

4,438,361

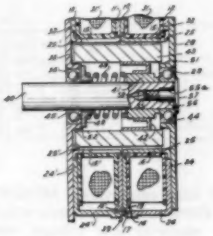
STEPPER MOTOR HAVING ROTOR WITH LIMITED AXIAL MOVEMENT

Harry G. Manson, Princeton, Ind., assignor to IMC Magnetics Corp., Jericho, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,819

Int. Cl.³ H02K 7/08

U.S. Cl. 310—90 **6 Claims**



1. A stepper motor comprising:

a stator,

a rotor rotatable with respect to the stator, the rotor having a shaft formed with a non-threaded axial bore,

bearing attachment means carried by the stator,

a pair of bearings carried by the bearing attachment means for rotatably supporting the rotor shaft, and

a stud frictionally, but non-threadably, fixed within the shaft bore, the stud having an enlarged head extending radially beyond the external contour of the shaft into axial alignment with at least part of one of the bearings,

whereby engagement between the stud head and the bearing limits the amount of axial movement of the rotor with respect to the bearing.

4,438,362

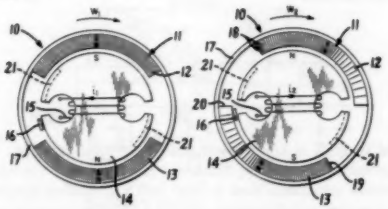
SELF-STARTING, DIRECT CURRENT MOTOR WITH PERMANENT MAGNETS OF VARIED MAGNETIC STRENGTH

Fred A. Brown, Woodstock, N.Y., assignor to Rotron, Incorporated, Woodstock, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,712

Int. Cl.³ H02K 21/12

U.S. Cl. 310—152 **8 Claims**



1. A self-starting, direct current motor comprising

first and second relatively rotatable members;

at least one winding and at least one salient pole on the first member;

at least one radially magnetized permanent magnet having a surface defining an arcuate sector of one magnetic polarity and facing the first member across an air gap, the arcuate sector extending less than 360°, the sector being a continuous single piece of magnetic material

said motor having at least one cogged position at a first angular relationship of the first and second members at which rela-

tive rotational forces between the first and second members are in equilibrium when the winding is energized;

said permanent magnet in said arcuate sector having circumferentially varying magnetic strength defining a location of increased magnetic strength nearer one end of the arcuate sector than the other end thereof in the circumferential direction; and

said salient pole and said location of increased magnetic strength being located to attract said first and second members away from said cogged position to an at-rest relative angular position that is angularly removed from the cogged position.

4,438,363

ELECTRICALLY CONTROLLED MECHANICAL POSITIONING DEVICE

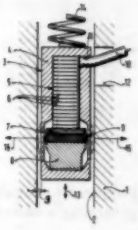
Rudolf Babitzka, Kirchberg, and Ernst Linder, Mühlacker, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,677

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039973

Int. Cl.³ H04R *17/00*; H01L *41/08*

U.S. Cl. 310—328 **13 Claims**



1. Electrically controlled mechanical positioning device of

a movable element (3) which is electrically controllable to, selectively, permit or inhibit movement under influence and control of an applied electrical signal, having

a support (1);

means (2) defining a guide-way in the support and guiding movementof the element,

and comprising, in accordance with the invention, a plurality of piezoelectric disks (6) stacked adjacent each other to form a stack assembly (5) in columnar form located within said element (3);

said element (3) having an elastically deformable portion;

said guide-way (2) having walls surrounding and retaining said movable element (3), said piezoelectric disks being secured within said element and, in dependence on a characteristic of an electrical signal applied to said stack assembly, expanding axially, and applying a deforming force to the elastically deformable portion which, in turn, applies a clamping force against the walls of the guide-way and, upon change of characteristics of the electrical signal, releasing the deforming, and hence clamping force and permitting movement of the movable element (3) in the guide-way.

4,438,364

PIEZOELECTRIC ACTUATOR

Rodney Morison, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 13, 1981, Ser. No. 282,478

Int. Cl.³ H01L *41/10*

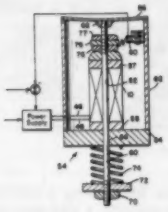
U.S. Cl. 310—328 **19 Claims**

1. An actuator for producing a force on a load in response to a single polarity D.C. voltage, comprising:

a stack of layers of a piezoelectric material having a central passage therethrough, each of the layers in said stack being not greater than 4 mils in thickness, each of said layers being poled to have an electrically positive surface and an electrically negative surface, said layers being positioned such that adjacent surfaces have like electrical polarities;

a first electrode connected to said electrically positive surfaces;

a second electrode connected to said electrically negative surfaces;



means for applying a potential difference between said first and second electrodes to produce an electric field in each said layer, said electric field causing a force in each said layer along the length of said stack for positioning the load; and

preload means wherein said preload means includes:

an actuator rod passing through said central passage;

a preload spring connected to said actuator rod; and

means, connected to said actuator rod, for urging said preload spring against said stack.

4,438,365

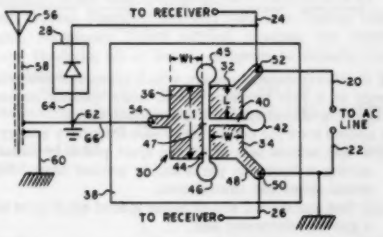
SPARK GAP FOR LINE TRANSIENT PROTECTION

Paul J. Atkinson, Buffalo Grove, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 16, 1982, Ser. No. 348,640

Int. Cl.³ H02H *1/04, 9/06*

U.S. Cl. 313—325 **10 Claims**



1. For use with electronic equipment coupled to a first power line which is at earth ground and to another power line which is at an elevated potential, a spark gap, comprising:

a first conductive pad adapted to be coupled to one power line;

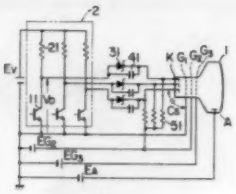
a second conductive pad adapted to be coupled to the other power line and spaced from the first pad so as to define a first gap therebetween; and

a third conductve pad adapted to be coupled to earth ground and spaced from said first and second pads so as to define a second gap which intersects said first gap.

4,438,366
CATHODE-RAY TUBE DRIVING APPARATUS

Yasuji Kamata, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 285,734
Claims priority, application Japan, Jul. 23, 1980, 55-99906
Int. Cl.³ H01J *23/34*
U.S. Cl. 315—1 **15 Claims**

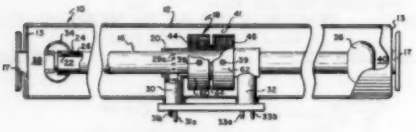


1. In an apparatus for driving a cathode-ray tube which includes at least one cathode, a grid associated with said cathode, and an anode, and a power supply connected to said cathode, grid and anode, the improvement comprising voltage regulating means connected to said power supply in series with said cathode for supplying a regulated voltage of predetermined value approximately equal to the voltage of said cathode which produces a predetermined high value of image luminance in said cathode ray tube, whereby the cathode driving voltage is reduced.

4,438,367
HIGH POWER RADIO FREQUENCY ATTENUATION DEVICE

Quentin A. Kerns, Bloomingdale, and Harold W. Miller, Winfield, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 30, 1981, Ser. No. 335,996
Int. Cl.³ H01J *25/10*
U.S. Cl. 315—5.41 **5 Claims**



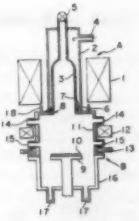
1. A radio frequency resistor which attenuates unwanted RF energy of a first resonant mode, while passing desired RF energy of a second resonant mode, comprising:
- a central core for conducting radio frequency energy;
- first and second sets of spaced-apart plates of metal alloy having a magnetic permeability greater than 1000, disposed about said central core;
- said first and second sets of plates spaced apart so as to form a gap therebetween; and
- first and second conductive shield means disposed about said first and said second sets of plates, respectively, and the gap between said first and said second sets of plates positioned to lie at point along said central core where the unwanted RF energy of said second resonant mode has a current maxima.

5. In a charged particle accelerator having a resonator tank disposed in the path of the charged particles, a conductive drift tube disposed within said resonator tank to lie in the path of said charged particles, corona rolls attached to each end of said drift tube to form gaps between said drift tube and said resonator tank, means for energizing said conductive drift tube with wanted RF energy of a first resonant mode such that current maxima of said wanted RF energy are located at said gaps, first and second sets of spaced-apart high magnetic permeability plates disposed about said drift tube central core, said first and said second sets of plates spaced apart so as to form a gap therebetween, first and second conductive shield means disposed about said first and said second sets of plates, respectively, and the gap between said first and said second sets of plates positioned to lie at points along said central core where unwanted RF energy of a second resonant mode has a current maxima.

4,438,368
PLASMA TREATING APPARATUS

Haruhiko Abe; Hiroshi Harada; Masahiko Denda; Koichi Nagasawa, and Yoshio Kono, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,730
Claims priority, application Japan, Nov. 5, 1980, 55-156086
Int. Cl.³ H01J *7/46, 19/80*
U.S. Cl. 315—39 **2 Claims**



1. A plasma treating apparatus comprising:
- an air-core coil for generating a static magnetic field which is axially uniform;
- a high-frequency waveguide for generating a high-frequency electromagnetic field which is irregular in the axial direction of said air-core coil;
- a plasma generating glass tube disposed in said high-frequency waveguide and adapted to be supplied with a gas whereby said electromagnetic field and said magnetic field cause an axial acceleration plasma flow in said tube;
- a plasma reaction bath held under a vacuum for receiving said plasma flow which is generated axially in said glass tube;
- a substrate platform disposed in said reaction bath for supporting a substrate to be treated at a right angle with respect to the plasma flow; and
- a magnetic field generating coil disposed outside of said reaction bath for shaping said plasma flow.

4,438,369
UNITARY LIGHT SOURCE COMPRISING COMPACT HID LAMP AND INCANDESCENT BALLAST FILAMENT

John M. Hicks, Penn Hills Township, Allegheny County, and Joseph C. Engel, Monroeville, both of Pa., assignors to North American Philips Electric Corp., New York, N.Y.

Continuation of Ser. No. 282,335, Jul. 10, 1981, abandoned. This application Jul. 14, 1983, Ser. No. 513,259
Int. Cl.³ H01J *7/44*
U.S. Cl. 315—49 **4 Claims**

1. A unitary light source for operation from a source of AC energizing potential, comprising an HID lamp, a light-emitting starting and operating circuit therefor, and input terminals for connection to a source of AC energizing potential; said light source providing illumination during the warm-up period required for said HID lamp and also after short periods of power interruption when said HID lamp is hot and thus difficult to start,

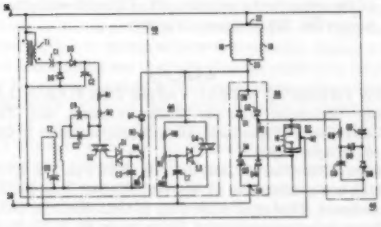
said HID lamp comprising an arc-enclosing envelope having spaced electrodes sealed therethrough and operable to sustain a high intensity discharge therebetween; and

said light emitting starting and operating circuit comprising:

an incandescent tungsten filament ballast device having two end portions;

a full-wave rectifier having two input terminals and two output terminals, one end portion of said filament ballast device being connected to one input terminal of said full-wave rectifier, the other end portion of said filament ballast device and the other input terminal of said full-wave rectifier being connected respectively to the unitary light source input terminals, and said HID lamp electrodes being connected respectively to the output terminals of said full-wave rectifier;

low impedance path means connected in parallel with said input terminals of said full-wave rectifier, for passing current through said ballast when said HID lamp is not operating, said means being actuated responsive to a predetermined potential developed across said input terminals of said full-wave rectifier during each half cycle of said AC energizing potential, which predetermined potential is greater than the maximum potential developed across said input terminals of said full-wave rectifier when said HID lamp is operating, to provide a path of low



electrical impedance which parallels said input terminals of said full-wave rectifier,

a pulse generating circuit connected in parallel with said input terminals of said full-wave rectifier, for providing a high starting voltage pulse for said HID lamp, said pulse generating circuit comprising an output terminal constituting a high-voltage electrode operatively associated with said HID lamp, arranged such that actuation of said low impedance path means, in response to a potential across said input terminals of said full-wave rectifier greater than said predetermined potential, triggers said pulse generating circuit to generate a high voltage pulse of magnitude sufficient to ionize the atmosphere within said arc-enclosing envelope of said HID lamp;

and

an HID lamp keep-alive and starting-aid having an input connected across said light source input terminals and an output connected across said output terminals of said full-wave rectifier, said keep-alive and starting-aid comprising means for storing DC energy of the same polarity as the output of said full-wave rectifier upon initial energization of said light-source, said DC energy being of predetermined charge and magnitude sufficient to sustain a discharge in said HID lamp for a short period during starting thereof and during periods of conduction minima of said full wave rectifier.

4,438,370

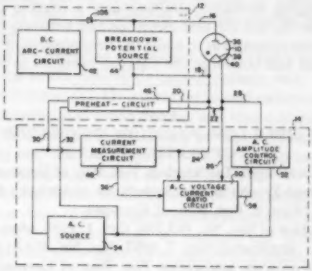
LAMP CIRCUIT

Robert W. Allington, Lincoln, Nebr., assignor to ISCO, Inc., Lincoln, Nebr.

Filed Mar. 3, 1981, Ser. No. 240,090

Int. Cl.³ H05B *41/36*

U.S. Cl. 315—106 **79 Claims**



1. Apparatus comprising:

an enclosure having at least one envelope portion capable of transmitting light therethrough;

said enclosure containing gas, an anode and a cathode;

said cathode and anode being spaced a predetermined distance apart within said container;

means for establishing potentials between said anode and cathode sufficient to initiate and sustain an arc within said gas, whereby light is emitted by said gas during operation of said apparatus and an anode-cathode current flows between said anode and cathode;

means for applying an AC potential across said cathode, whereby an AC current flows through said cathode in addition to said anode-cathode current; and

means for controlling the electrical power applied to said cathode to maintain the AC potential across said cathode at a value that maintains a predetermined relationship between the AC potential drop across said cathode and the AC current through the cathode during the operation of said apparatus.

4,438,371

SOURCE OF CHARGED PARTICLES BEAM

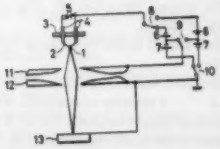
Shigeyuki Hosoki, Hachioji; Masaaki Futamoto, Tsukui; Ushio Kawabe, Nishitama; Tohru Ishitani, Sayama, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,417

Claims priority, application Japan, May 22, 1981, 56-76502

Int. Cl.³ H01J *7/24*

U.S. Cl. 315—111.81 **12 Claims**



1. A source of charged particles comprising: a charged particles generating chamber; a tip disposed inside the charged particles generating chamber, the tip material being carbides, nitrides or di-borides of at least one of elements Ti, Zr, Hf, V, Nb and Ta or hexa-borides of at least one of rare earth metal

elements of atomic number 57 to 70; a supporter for supporting the tip; a source for supplying material to be ionized; a first electrode for producing a field near the tip to draw out the charged particles generated; a second electrode for accelerating and converging the charged electrodes drawn out by the first electrode; a first electric source connected between the tip and the first electrode; a second electric source connected between the first and second electrodes; and a switching means for changing virtually simultaneously a relative polarity between the tip and the first electrode and between the first and second electrodes so as to make the field positive or negative to accelerate and converge the charged particles as desired.

4,438,372

MULTIPLE LOW-PRESSURE DISCHARGE LAMP OPERATING CIRCUIT

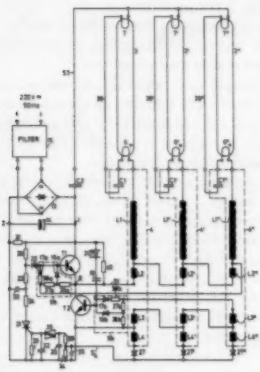
Anton Zuchtriegel, Taufkirchen, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 193,254, Oct. 1, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,413

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941822

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—224 **24 Claims**



1. Low-pressure discharge lamp operating circuit for connection to a plurality of discharge lamps (3, 3' . . . 3ⁿ) having first and second electrodes (7, 6),

said circuit comprising

connection means (1, 2) for connection to a d-c source (5);

a self-excited push-pull oscillator circuit including

two serially connected transistors (T1, T2) of the same conductivity type, connected across the d-c source and having a common junction (8);

a plurality of individual separate series resonance starting circuits (4, 4' . . .), connected to said serially connected transistors (T1, T2), each having a first terminal connected to the second electrode (6) of a respective lamp of the plurality of lamps,

wherein the individual series resonance circuits (4, 4' . . .) each include

a separate individual ballast inductance having a main winding (L1, L1' . . .) serially connected by a first terminal with the second lamp electrode (6) of a respective lamp, and a separate individual capacitor (C1, C1' . . .) serially connected to the main winding of the individual ballast inductance, and coupled in parallel to the respective lamp,

said ballast inductances including inductively coupled first control windings (L2, L2' . . .) and second control windings (L3, L3' . . .) to form, with the main windings, individual transformers, in which the main winding forms the primary and the first and second control windings form secondary windings;

a first bus (S1) connecting said common junction (8) to the second terminals of the plurality of inductances, and hence through the inductances to the second electrodes (6) of the lamps;

a second bus (S3) connecting one of the connection means (1) on the d-c source (5) to the first electrodes (7) of the lamps,

capacitor means (C2) in one of said buses to isolate d-c from the lamp electrodes (7, 6);

a control circuit to control said two transistors (T1, T2) for alternate conduction or blocking condition and to supply high-frequency alternating power to the lamps, including

connection means (9*a*, 9*b*) between the emitters and bases of the transistors (T1, T2) and the first and second control windings (L2, L2' . . . L3, L3' . . .),

and a starting circuit (10) connected to the base of one (T2) of the transistors including means (20) for energizing said starting circuit upon connection of the lamp operating circuit to a power source;

wherein the main winding (L1) and the first and second control windings (L2, L3) are wound on a common core; and

the first and second control windings (L2, L2' . . . ; L3, L3' . . .) of the respective plurality of inductances are, respectively, connected in series, and the series-connected respective first and second control windings are connected in briding circuit relationship across the base-emitter paths of the respective transistors (T1, T2), with said connection means (9*a*, 9*b*) interposed therein.

4,438,373

LOW PRESSURE METAL VAPOR DISCHARGE LAMP

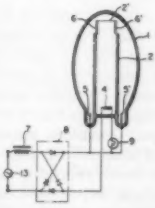
Yoshio Watanabe, Koutou; Mikiya Yamane, and Teruichi Tomura, both of Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 158,264, Jun. 10, 1980, Pat. No. 4,335,331, which is a continuation of Ser. No. 932,546, Aug. 10, 1978, abandoned. This application Jun. 1, 1982, Ser. No. 383,944

Claims priority, application Japan, Aug. 10, 1977, 52-95041; Sep. 28, 1977, 52-115622; Sep. 28, 1977, 52-115623; Sep. 28, 1977, 52-115624

Int. Cl.³ H05B *41/16*

U.S. Cl. 315—334 **8 Claims**

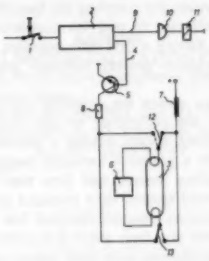


1. A low pressure metal vapor discharge lamp comprising an outer glass envelope defining an enclosed discharge space; an inner glass tube disposed within said envelope and having an open end and a closed end; a cathode disposed within said tube; a plurality of anodes disposed within said envelope outside said tube; and circuit means for simultaneously applying voltage to the anodes, said circuit means including ballast means in the form of a single ballast connected in common to said anodes to provide current stabilization and means connected between said anodes for shunting discharge current in equal amounts to each of said anodes, said discharge current being regulated by said common single ballast.

4,438,374
CONTROL OF ELECTRIC DISCHARGE LAMPS FOR SCANNING PURPOSES

Helmut Karius, Schönkirchen, Fed. Rep. of Germany, assignor to Dr.-Ing. Rudolf Hell G.m.b.H., Kiel, Fed. Rep. of Germany

PCT No. PCT/DE80/00174, § 371 Date Jul. 13, 1982, § 102(e) Date Jul. 13, 1982, PCT Pub. No. WO82/01802, PCT Pub. Date May 27, 1982
PCT Filed Nov. 22, 1980, Ser. No. 403,512
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—362 **4 Claims**

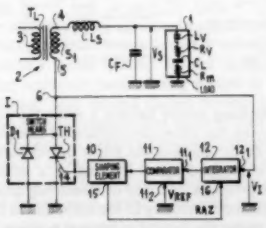


1. A method for prevention of cataphoresis actions in the case of electric discharge lamps operated by direct current, in particular during their utilisation in picture transmission apparatus with nonpunctiform illumination of the original portions which are to be scanned, characterised in that the lamp incandescence period is measured in a first polarity during a first picture transmission and is stored, that the polarity is reversed before beginning a second picture transmission, that the lamp incandescence period in the second polarity is equally measured and stored, that the difference between the first and second incandescence periods is established and stored, and that a balance quantity of the total incandescence period is established in this manner during all subsequent transmissions under consideration of the polarity which, being compared to the incandescence period of the last transmission, reverses the polarity of the lamp voltage before the following transmission only if the last incandescence period had been longer than the carry-over stored.

4,438,375
ELECTRIC CIRCUIT FOR CONVERTING AN AC VOLTAGE INTO A DC VOLTAGE OR A VOLTAGE VARIABLE AT A LOWER FREQUENCY

Joseph Colineau, and Jean Y. Maheo, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Dec. 31, 1980, Ser. No. 221,799
Claims priority, application France, Jan. 8, 1980, 80 00307
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **19 Claims**



1. An electrical circuit for converting an ac voltage applied to an input (S1) to a dc voltage (Vs) variable at a lower frequency at an output (1), comprising

(a) a filter (LS,CF) connected between said input and output;

(b) switch means (I) having an output (6) connected in series with said input, said filter, and said circuit output and on that side of the filter which is connected to said input, for conducting during each cycle of the ac voltage for a period of time in accordance with the desired dc output voltage;

(c) means for receiving a reference signal (112,VREF) proportional to the desired dc output voltage; and

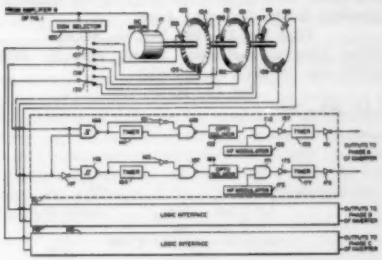
(d) control means (11,12) connected to said switch means (I) for operating said switch means and thus controlling the output dc voltage (VS), having an input (at 112) for receiving said reference signal (VREF), and an input (121) connected to said switch means (I);

said control means including means for establishing (12) a mean value of a voltage at said switch means output (6) during a cycle of input ac voltage, and including an output (to 14) connected to said switch means for operating said switch means, said control means operating said switch means in accordance with and slaved to instructions from said reference signal and proportional to a mean value of said voltage at said switch means output (6).

4,438,376
VARIABLE SLIP CONTROLLER FOR AN AC MOTOR

Marlen Varnovitsky, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,350
Int. Cl.³ H02P *5/40, 5/46*
U.S. Cl. 318—78 **2 Claims**



1. A variable slip control system for an AC motor comprising:

means for generating a voltage signal proportional to the shaft speed of said AC motor;

variable gain amplifier means for controlling the ratio between motor shaft speed and stator frequency and thus the slip and for receiving said shaft speed signal and providing a signal proportional to stator frequency which is dependent on commanded gain;

means for providing a DC starting signal to said variable gain amplifier means;

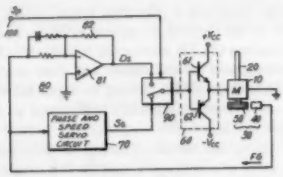
pulse width modulation signal generator means for rotating optically encoded means at a speed proportional to said frequency signal and for scanning the last-mentioned means and optically decoding information thereon into electrical pulse width modulation switching pulses which are supplied to appropriate switches in an inverter;

said inverter supplying variable frequency and variable magnitude power to the stator of said AC motor.

4,438,377
STOP CONTROL CIRCUIT FOR BRUSHLESS DC MOTOR

Masaaki Sakai, and Mitsugu Yoshihiro, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,219
Claims priority, application Japan, Jun. 6, 1980, 55-76806
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—254 15 Claims

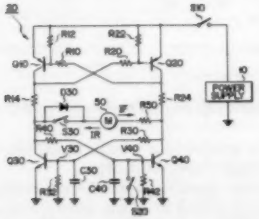


1. A drive control circuit for a brushless DC motor comprising bidirectional-rotation driving circuit means for applying current in either of two opposite directions to said motor; servo circuit means providing a servo output signal for said driving circuit means to control the phase and speed of said motor; rotation detecting means for providing a phase signal whose magnitude and polarity indicate the electrical rotational angle of said motor; amplifier means amplifying said phase signal and providing an output voltage that varies according to said phase signal; and controllable switching means having a first condition for normally providing said servo output signal to said driving circuit means, and a second condition for applying said output voltage to said driving circuit means in a sense to brake said motor.

4,438,378
MOTOR DRIVE APPARATUS

Tosio Tanaka, Gunma, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 22, 1982, Ser. No. 341,626
Claims priority, application Japan, Jan. 30, 1981, 56-11057[U]; Jun. 25, 1981, 56-93974[U]
Int. Cl.³ H02P *1/22*
U.S. Cl. 318—280 6 Claims



1. A motor drive apparatus for driving a reversible motor first in a first direction, then stopping it and then driving it in a second direction opposite to said first direction, comprising:

power switch means for receiving current from a power supply and passing that current in a closed state thereof or blocking current in an open state thereof;

a first flip-flop having 1st and 2nd transistors of a first conductivity type, a base of said 1st transistor being coupled to a collector of said 2nd transistor, a base of said 2nd transistor being coupled to a collector of said 1st transistor, emitters of said 1st and 2nd transistors being coupled to, said power switch means for receiving current therefrom when said switch means is in said closed state and the collectors of said 1st and 2nd transistors being respectively coupled to opposite terminals of said motor;

a second flip-flop having 3rd and 4th transistors of a second conductivity type opposite to said first conductivity type, emitters of said 3rd and 4th transistors for being coupled to a return of said power supply, the collector of the third transistor being coupled to the collector of the first transistor and the collector of the fourth transistor being coupled to the collector of the second transistor;

power switch means positioned on a power supply line of said power supply, for conducting a power of said power supply to said 1st through 4th transistors;

first coupling means for coupling the base of said 3rd transistor to the collector of said 4th transistor, said first coupling means having a first time constant which retards a potential variation passing through said first coupling means;

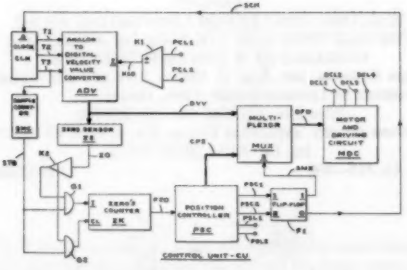
second coupling means for coupling the base of said 4th transistor to the collecdtor of said 3rd transistor, said second coupling means having a second time constant which retards a potential variation passing through said second coupling means, said first time constant being longer than said second time constant such that said 1st and 4th transistors conduct and said 2nd and 3rd transistors are cut off at a time when said power switch means first conducts current from said power supply, said conductor by said 1st and 4th transistors causing current to flow in a first direction through said motor causing it to operate in said first direction; and

trigger switch means, coupled to said 4th transistor, for rendering said 4th transistor non-conductive when said trigger switch means is activated, thereby stopping current flow through said motor to stop it, and then causing said 3rd transistor to conduct in response to said first time constant thereby causing current to flow in said second direction through said motor, causing it to operate in said second direction.

4,438,379
METHOD OF DAMPING A STEPPING MOTOR

David Chiang, Dix Hills; Mosi Chu, Setauket, and Solomon Manber, Sands Point, all of N.Y., assignors to MSS Associates, Short Hills, N.J.

Filed Jun. 15, 1981, Ser. No. 273,625
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—685 11 Claims



1. In a stepping motor having a rotatable stator magnetic field for driving the rotor, the method of damping the oscillations of the rotor which occur when the rotatable stator magnetic field is stopped upon arriving at a desired rotational position comprising a first step of measuring quantities related to the instantaneous velocity of the rotor due to the oscillations of the rotor about the desired rotational position, a second step of modifying the stator magnetic field by at least a rotational displacement from the desired rotational position in a direction

opposite to the direction of the oscillation by an amount which is a continuous function of the instantaneous velocity, and a third step of thereafter returning the stator magnetic field to the desired stopping position.

4,438,380

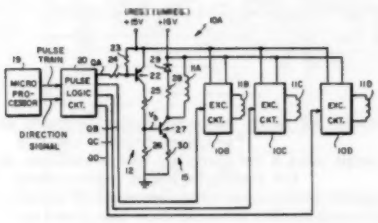
STEPPING MOTOR EXCITATION CIRCUITRY

Robert G. Kaseta, Stow, Mass., assignor to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 917,564, Jun. 21, 1978, abandoned. This application Dec. 23, 1980, Ser. No. 219,512

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **4 Claims**



1. A disk storage system having movable transducer means for writing data onto or reading data from a surface of one or more storage disks, said system comprising

a stepping motor system for positioning said movable transducer means relative to a surface of said one or more storage disks, said stepping motor system comprising a stepping motor having a plurality of excitation windings capable of having current pulses supplied thereto for moving said stepping motor in discrete steps;

means coupling said stepping motor to said transducer means for moving said transducer means in discrete steps;

current drive circuits associated with each of said windings and responsive to an input driver signal for supplying current to its associated winding when said input driver signal is supplied thereto, each said current drive circuit including

a first circuit including switching transistor means responsive to said input driver signal and having a pair of precision resistance means in the collector circuit thereof for supplying a substantially constant voltage at the junction of said precision resistors;

a regulated power supply means for supplying power to said first circuit;

a second circuit comprising a transistor circuit means having a substantially constant base-to-emitter voltage, said associated winding being placed in the collector circuit thereof and resistance means being placed in the emitter circuit thereof, said second circuit having substantially greater power requirements than those of said first circuit and being responsive to said substantially constant voltage for supplying a substantially constant current to said associated winding independently of the winding resistance when said driver input signal is supplied to said first circuit; and

an unregulated power supply means for supplying power to said second circuit.

4,438,381

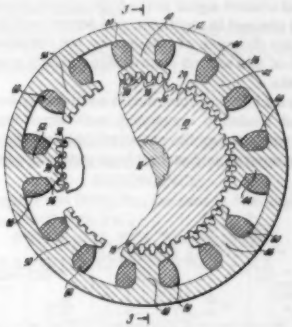
SYNCHRONOUS MOTOR SYSTEM

John H. Field, II, Norfolk, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Continuation of Ser. No. 72,323, Sep. 4, 1979, abandoned, which is a continuation of Ser. No. 742,690, Nov. 17, 1976, Pat. No. 4,255,696, which is a continuation-in-part of Ser. No. 654,400, Feb. 2, 1976, abandoned. This application Feb. 3, 1982, Ser. No. 345,617

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **8 Claims**



1. A synchronous motor system responsive to input pulses, comprising a motor including a stator and a rotor movable relative to each other about a common axis, said stator having a plurality of radially directed stator poles, said poles having stator teeth arranged in a circle around the axis, said rotor having a plurality of rotor teeth arranged about the axis, said rotor teeth being permanently magnetized, a plurality of winding means on said stator poles for inducing magnetic fields in said poles in radial directions, each of said poles having at least one winding; and circuit means coupled to said winding means and responsive to input pulses, said circuit means including a plurality of switches each connected in series with one of said winding means; said circuit means including driver means coupled to said switches and responsive to the pulses for rendering a plurality of said switches conductive simultaneously and energizing said connected winding means simultaneously so that each switch when conductive carries only the current for inducing magnetism in one pole, and so that the pulses energizing the windings all have levels of substantially the same absolute value.

4,438,382

THREE PHASE AC MOTOR CONTROLLER

Michael Vuckovich, Elizabeth; Maynard K. Wright, Bethel Park, and John P. Burkett, South Huntington Township, Westmoreland County, all of Pa., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 30, 1981, Ser. No. 279,501

Int. Cl.³ H02P *3/20*

U.S. Cl. 318—744 **4 Claims**

1. A motor controller for applying power to a reversible multiphase AC motor through power switch means which are adapted to reverse the phase excitation of the motor in both a running and braking mode of operation, comprising in combination:

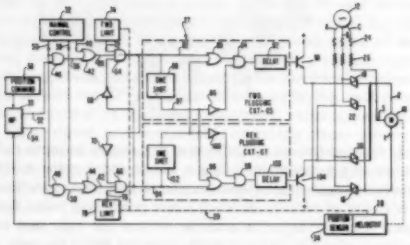
forward and reverse command signal means;

first and second cross coupled logic circuit means respectively implementing forward and reverse command signal channels coupled between said command signal means and said power switch means,

wherein each of said first and second logic circuit means com-

prises means for mutually exclusively coupling a first control signal to said power switch means to effect a predetermined direction of rotation of said motor and respective plugging circuit means for braking said motor, said plugging circuit means including pulse signal generator means becoming operable in response to a predetermined logic signal level of said first control signal to output a second control signal of a predetermined pulsewidth to inhibit further operation of the logic circuit means of the respective signal channel for duration of the pulsewidth of said second control signal and thereby deactivate said power switch means for said predetermined direction of rotation and additionally coupling said second control signal to the logic circuit means of the other signal channel to reactivate said power switch means for the opposite direction of rotation for the duration of the pulsewidth of said second control signal which causes said motor to brake,

wherein each logic circuit means additionally includes first and second tandemly connected multi-input logic gates, said logic gates having the output of said first logic gate coupled to one input of said second logic gate and wherein one input



of said first logic gate is coupled to said first control signal, said pulse signal generator means of the other signal channel being coupled to another input of said first logic gate for coupling its respective second control signal thereto, and additionally including circuit means coupled from the output of said pulse signal generator means of the respective signal channel to another input of said second logic gate of the respective signal channel to enable said second logic gate when the pulse generator means of the respective signal channel is inoperative, said second logic gate thereby coupling said first control signal to said power switch means but becoming inhibited upon said pulse signal generator means of the respective signal channel being triggered to deactivate said power switch means for said predetermined direction of rotation, and

wherein said first logic gate of each logic circuit means comprises an OR gate and said second logic gate comprises an AND gate, and additionally including logic inverter means coupling the output of said signal generator means of the respective signal channel to said another input of said AND gate.

4,438,383

ROCK CRUSHER MOTOR CONTROL CIRCUIT FOR PREVENTING RELAY DROP OUT

J. Eugene Etheridge, Richmond, Va., assignor to Etheridge Electric, Inc., Richmond, Va.

Filed Jul. 15, 1982, Ser. No. 398,947
Int. Cl.³ H02P *5/28*
U.S. Cl. 318—799 **12 Claims**

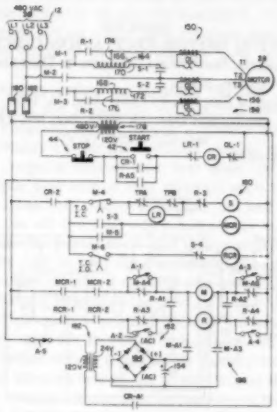
1. A motor control circuit for operating a motor driving a load which cannot be started under load but which maintains sufficient momentum to resume normal operation upon restoration following momentary interruption of a main power source, said circuit serving to prevent motor starter relay drop out during such momentary interruptions, and said circuit comprising:

a magnetic motor starter relay including an actuating coil and a set of normally-open main contacts connected for energizing the motor from the main power source;

a starting circuit for initially energizing said actuating coil from the main power source;

a storage capacitor and a DC power supply connected for charging said storage capacitor and maintaining the charge when the main power source is available;

an auxiliary contact arrangement operable following initial energization of said actuating coil to disconnect said actuat-



ing coil from the main power source and to connect said actuating coil for energization from said storage capacitor and said DC power supply such that, upon subsequent momentary interruption of the main power source, energy stored in said capacitor maintains said actuating coil of said motor starter relay energized until restoration of the main power source; and

said DC power supply being arranged to initially provide a relatively higher voltage to ensure actuation of said motor starter relay and, subsequent to full actuation of said motor starter relay, to provide a relatively lower voltage at least sufficient to hold said motor starter relay in an actuated condition.

4,438,384

GENERATION INDICATING APPARATUS FOR VEHICLE ALTERNATORS

Yoshio Akita, Ichinomiya; Toshinori Maruyama, Kariya, and Katsuya Muto, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 21, 1981, Ser. No. 294,822
Claims priority, application Japan, Aug. 29, 1980, 55-119413
Int. Cl.³ H02J *7/16*
U.S. Cl. 320—48 **4 Claims**

1. A generation indicating apparatus in a charging system having an alternator, a voltage regulator and a battery, said generation indicating apparatus comprising:

a generation detecting circuit connected to receive an output of said alternator for determining a generation condition of said alternator and for producing a detection signal when the generation condition reaches a predetermined condition after the start of an engine;

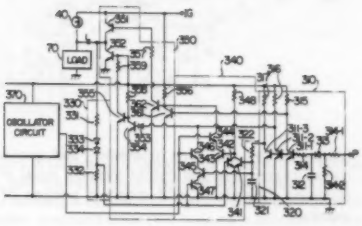
indicator means for indicating the generation condition of said alternator;

a drive circuit including a drive transistor circuit for operating said indicator means, said drive circuit having an input terminal connected to said generation detecting circuit

and an output terminal connected to said indicator means, said drive circuit operating said indicator means to indicate that said alternator is in a non-generating condition until said detection signal is received from said generation detecting circuit and to indicate that said alternator is in a generating condition after said detection signal is received; and

a protection and reset circuit for forcedly stopping the operation of said drive circuit upon occurrence of an abnormal voltage on a line connected between said output terminal of said drive circuit and said indicator means and for resetting said drive circuit to recover a normal operation after said abnormal voltage is removed,

said protection and reset circuit including



an abnormal voltage detecting circuit for detecting said abnormal voltage on said line,

an oscillator circuit for producing a pulse signal having predetermined on and off periods, and

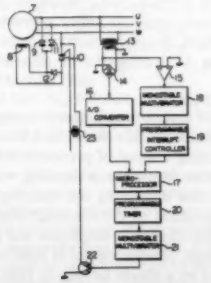
a control circuit connected to said abnormal voltage detecting circuit, said oscillator circuit and said drive circuit and for providing said pulse signal as a control signal to said drive circuit thereby to turn on and off said drive transistor of said drive circuit upon detection of said abnormal voltage by said abnormal voltage detecting circuit, wherein the conduction of said drive transistor is limited to the on period of said pulse signal to protect said drive transistor and said abnormal voltage is gradually removed through the conduction of said drive transistor.

4,438,385

AUTOMATIC VOLTAGE REGULATION SYSTEM FOR AC GENERATOR

Hiroyasu Sato; Kazuaki Yamamoto, both of Hitachi, and Hiroaki Aotsu, Nakaminato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1982, Ser. No. 380,263
Claims priority, application Japan, May 26, 1981, 56-78656
Int. Cl.³ H02P *9/00, 9/10*
U.S. Cl. 322—28 **5 Claims**



1. In an automatic voltage regulation system for an AC generator, having voltage detector means for detecting an output voltage of the AC generator and a thyristor for controlling the field current in accordance with the difference between a reference voltage and the voltage detected by said detector means, said automatic voltage regulation system further comprising:

synchronous point detector means for detecting a synchronous point of the output voltage of said AC generator;

a microprocessor for computing a firing angle of said thyristor in accordance with the difference between said reference voltage and the voltage detected by said voltage detector means and producing a signal representing the computed firing angle at the time of detection of the synchronous point; and

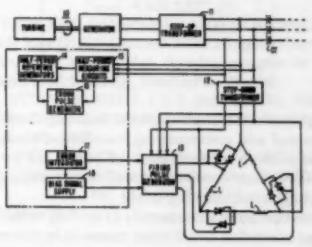
firing control means for turning on said thyristor in response to the firing angle signal at the firing angle computed by said microprocessor.

4,438,386

STATIC VAR GENERATION FOR TRANSMISSION LINE COMPENSATION OF SUBSYNCHRONOUS RESONANCE

Laszlo Gyugyi, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1981, Ser. No. 300,841
Int. Cl.³ H02J *3/16*
U.S. Cl. 323—210 **2 Claims**



1. A static VAR generator and network stabilizer comprising:

(a) a reactance means disposed for connection into an AC network;

(b) a frequency monitoring means for measuring the period of the network voltage and comparing it to the period of a reference voltage cycle to detect subsynchronous resonance in said AC network;

(c) a control means connected to said reactance means and said frequency monitoring means for connection of said reactance means into said AC network to damp subsynchronous resonance in said AC network.

4,438,387

TURN-ON CONTROL SYSTEM FOR VOLTAGE DROP COMPENSATORS

Frederick Rohatin, 166-10 - 15th Dr., Whitestone, N.Y. 11357

Filed Jun. 8, 1981, Ser. No. 271,202
Int. Cl.³ G05F *1/24*
U.S. Cl. 323—260 **10 Claims**

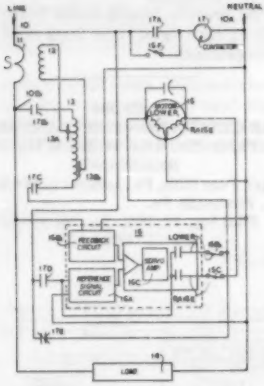
1. A turn-on control system for voltage compensation means being fed from incoming service lines, said system comprising, in combination:

compensating transformer means including primary winding means and secondary winding means, said secondary winding means being connected in series with said service lines;

variable voltage corrective transformer means connected across said primary winding means for feeding corrective

power thereto and thence to induce into said secondary winding means corrective voltage;

voltage detection control means having automation responsive to the presence of line voltage, for disconnecting said variable voltage transformer corrective means from its input lines upon occurrence of a power blackout and for placing said variable voltage corrective transformer means as a damping load across said primary winding means, said secondary winding means acting as a primary winding means and said primary winding means acting as a secondary winding means while said variable voltage corrective transformer means is so connected and said



voltage detection control means disabling itself, its automation and said compensating transformer means;

means responsive to restoration of power for setting said variable voltage corrective transformer means to its lowest voltage compensating point;

and means operative subsequently to settling of said variable voltage corrective transformer means to its lowest voltage compensating point for reconnecting said variable voltage corrective transformer means to its input and for effecting restoration of said primary winding and secondary winding means to their normal respective functions whereupon said voltage detection control means, its automation and said compensating transformer means are restored.

4,438,388

SINGLE STAGE OPERATIONAL AMPLIFIER VOLTAGE REFERENCE

Robert D. Lee, Denton, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 11, 1981, Ser. No. 329,838
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—313 **11 Claims**

1. A single stage operational amplifier voltage reference for providing a selected output current at a predetermined output voltage via an output terminal, the voltage reference comprising:

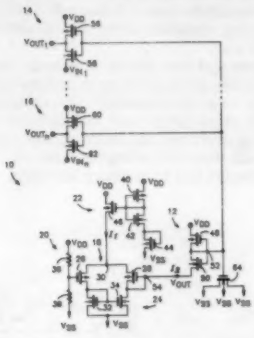
first voltage biasing means for providing a bias voltage substantially equal to said predetermined output voltage;

a constant current source for providing a bias current substantially equal to said selected output current;

a first transistor of a first conductivity type having a first current electrode coupled to said constant current source to conduct a portion of said bias current, a second current electrode, and a control electrode coupled to the bias voltage provided by said first voltage biasing means;

a second transistor of said first conductivity type having a first current electrode coupled to said constant current source to conduct a portion of said bias current, a second current electrode coupled to said output terminal, and a control electrode coupled to said output terminal; and

a current mirror for receiving the portion of the bias current



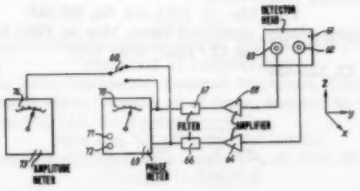
conducted by said first transistor, and providing said output current via said output terminal equal to a predetermined multiple of said received portion of the bias current.

4,438,389

METHOD FOR UTILIZING THREE-DIMENSIONAL RADIATED MAGNETIC FIELD GRADIENTS FOR DETECTING SERVING FAULTS IN BURIED CABLES

Alten J. A. De Sa, Gosforth, England, assignor to Geodate Limited, England

Filed Aug. 15, 1980, Ser. No. 179,278
Claims priority, application United Kingdom, Aug. 18, 1979, 7928837; Aug. 22, 1979, 7929258
Int. Cl.³ G01R *31/08*; G01V *3/11*
U.S. Cl. 324—52 **10 Claims**



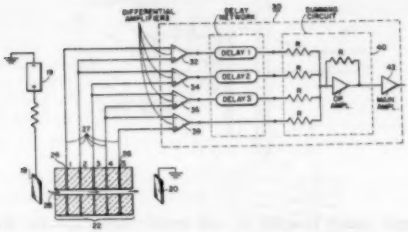
1. A method of monitoring the performance of an elongate electrically conductive cable sheath and its serving, including the steps of injecting a signal of predetermined frequency into the sheath, in order to produce a standing wave on the sheath and its serving, and examining the standing wave profile in amplitude and gradient of the resulting magnetic $\vec{H}$ field, to detect a coincident change in amplitude and gradient which is indicative of a fault, comparing the $\vec{H}$ field examined with the $\vec{H}$ field produced by a sheath having no fault, determining the position of distortion in the examined $\vec{H}$ field from that comparison and determining the position of a fault from the position of the distortion.

4,438,390

TANDEM SENSING ZONES FOR IMPROVED SIGNAL-TO-NOISE RATIO IN PARTICLE ANALYZER

Walter R. Hogg, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 23, 1981, Ser. No. 246,755
Int. Cl.³ G01N 27/00
U.S. Cl. 324—71.1 18 Claims



1. A particle analyzing apparatus for detecting properties of particles, said particle analyzing apparatus including a first vessel for holding a conductive liquid having a suspension of said particles, a second vessel for holding a conductive liquid, a flow cell having an aperture formed therethrough to provide a constricted liquid passageway between said first vessel and said second vessel, means for moving a quantity of the conductive liquid from said first vessel through said aperture and into said second vessel, means for providing current through said aperture, the improvement comprising:

an arrangement, including said flow cell, of alternately arranged sensing electrodes and dielectric plates wherein each dielectric plate can define a separate particle sensing zone, there being at least three of said sensing electrodes and at least two of said dielectric plates with one of said sensing electrodes being sandwiched between the two said dielectric plates, said flow cell being formed by said dielectric plates and at least said sensing electrode sandwiched therebetween with said aperture passing therethrough;

means electrically coupled to a pair of sequentially located said sensing electrodes on opposed sides of each of at least two said dielectric plates to separately detect electrical pulses produced by particles passing through each of the said dielectric plates;

means for delaying at least all but the last of said electrical pulses for each particle so that said electrical pulses occur simultaneously; and

means for summing said simultaneous electrical pulses; whereby an improved signal to noise ratio is achieved.

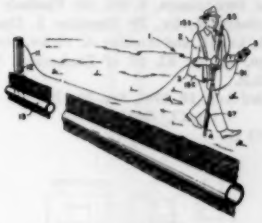
4,438,391

ELECTRICAL SURVEY APPARATUS AND METHOD WITH SPINNER-TYPE CONDUCTOR SUPPLY

Joseph W. Rog, Medina, Ohio; Charles G. Waits, Hanover Park, and Karl W. Nicholas, Roselle, both of Ill., assignors to Harco Corporation, Medina, Ohio

Continuation of Ser. No. 972,041, Dec. 21, 1978, abandoned. This application Jan. 21, 1982, Ser. No. 341,167
Int. Cl.³ G01V 3/15; G01R 31/02; G01N 27/00; G01B 7/02
U.S. Cl. 324—71.1 45 Claims

1. An apparatus for making electrical surveys of structures contained in an electrolyte, said apparatus comprising electrode means for obtaining information of an electrical parameter of the electrolyte proximate the structure at a plurality of locations, wire means having one end portion electrically coupled with respect to such structure to receive information of an electrical parameter of the structure at a reference location with respect thereto and for transmitting an electrical signal proportional to the electrical parameter of the structure at the reference location, sensing means connected with said electrode means and said wire means for electrically sensing such electrical parameters, and spinner-type storage means for storing said wire means and for paying out said wire means with a spinner-type action to accommodate movement of said sensing means between said locations while said wire means remains electrically coupled with respect to such structure,



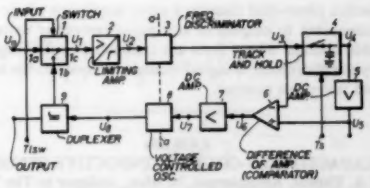
said spinner-type storage means including a spool about which said wire means is wound, said spool being non-rotating during such paying out of said wire means therefrom, said wire means having an electrical pigtail-like end portion emanating at said spinner-type storage means electrically connected with said sensing means.

4,438,392

DEVICE FOR SAMPLING AND HOLDING THE CARRIER FREQUENCY OF SHORT DURATION PULSES

Bo A. Morwing, ASA Station, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE80/00312, § 371 Date Jul. 31, 1981, § 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01616, PCT Pub. Date Jun. 11, 1981
PCT Filed Dec. 4, 1980, Ser. No. 287,711
Claims priority, application Sweden, Dec. 4, 1979, 7909984-2
Int. Cl.³ G01R 23/14
U.S. Cl. 324—79 R 1 Claim



1. A carrier frequency sample and hold circuit comprising switching means controllably switching between a first input adapted to receive a carrier frequency pulse signal of low duty cycle, a second input and an output, frequency discriminator means for converting the carrier frequency signal to an analog signal having an amplitude which is a function of the frequency of an input signal, said frequency discriminator having an input connected to the output of said switching means and an output, an analog track and hold means periodically switchable between a track and hold mode in synchronism with said switching means, said analog track and hold means having an input connected to the output of said frequency discriminator means and an output, a difference amplifier means having first and second inputs connected respectively to the outputs of said frequency discriminator means and said track and hold means and an output, voltage controlled oscillator means for emitting a signal having a frequency related to the amplitude of a received signal, said voltage controlled oscillator means having an input connected to the output of said difference amplifier means and an output connected to the other input of said

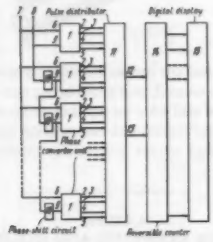
switching means, and utilization means connected to the output of said voltage controlled oscillator means.

4,438,393

PHASE-METERING DEVICE

Leonid M. Moskalik, ulitsa Molodezhnaya, 13, kv. 177; Vladimir E. Ryadchikov, ulitsa Gagarina, 28, kv. 59; Anatoly P. Bykov, ulitsa Stroitelnaya, 6, kv. 16; Vladimir P. Kulesh, ulitsa Stroitelnaya, 6, kv. 29; Stanislav I. Opasov, ulitsa Chkalova, 11, kv. 11, and Anatoly A. Orlov, Naberezhnaya Tsiolkovskogo, 22, kv. 82, all of Zhukovsky, Moskovskoi oblasti, U.S.S.R.

Filed Aug. 18, 1981, Ser. No. 294,026
Int. Cl.[3] G01R *25/00*
U.S. Cl. 324—83 D **4 Claims**



1. A phase-metering device comprising: first and second input signal source; N−1 phase-shift circuits at N exceeding two and a phase-shift of each circuit being π/N radians, said N−1 phase-shift circuits being electrically-connected in series, an input of the first circuit being connected to the second input signal source; N phase converter units each having positive and inverted outputs and two pulse outputs, first inputs of said units being connected to the first input signal source, a second input of the first phase converter unit being coupled to the second input signal source, while second inputs of the other phase converter units are connected to the outputs of the respective phase-shift circuits; a pulse distributor whose inputs are connected to outputs of said phase converter units; a reversible counter whose inuts are connected to the outputs of said pulse distributor; a digital recorder coupled to the outputs of said reversible counter.

4,438,394

CAPACITIVELY-COUPLED INDUCTIVE SENSOR

Carl A. Ekdahl, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1981, Ser. No. 253,490
Int. Cl.[3] G01R *19/28, 15/00*
U.S. Cl. 324—126 **1 Claim**

1. A capacitively coupled inductive sensor for detecting a pulsed current generated in a coaxial transmission line having an inner and outer conductor comprising:

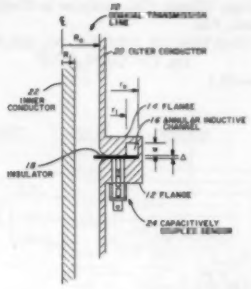
first and second flanges formed in said outer conductor of said coaxial transmission line;

an insulator disposed between said first and second flanges capable of insulating between a portion of said first and second flanges;

an annular inductive channel formed in said second flange contiguous to said insulator, so that current flowing between said first and second flanges flows around said insulator and said annular inductive channel;

an electrode disposed in said first flange adjacent said insulator such that said electrode is capacitively coupled to said second flange;

a feedthrough capacitor capacitively coupling said electrode to said first flange; and



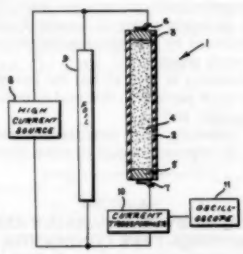
output means coupled to said feedthrough capacitor for providing an output signal proportional to and having a substantially reduced magnitude from said pulsed current.

4,438,395

CURRENT TRANSFORMER HIGH VOLTAGE PROBE UTILIZING COPPER SULFATE WATER RESISTOR

Charles R. McClenahan, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 21, 1981, Ser. No. 265,865
Int. Cl.[3] G01R *15/02*; H01C *11/00*
U.S. Cl. 324—127 **2 Claims**



1. A device for measuring fast high voltage pulses comprising

a current transformer having a primary winding and a secondary winding,

a copper sulfate water resistor connected in series with said primary winding,

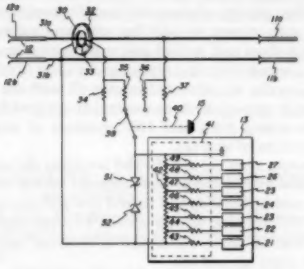
means for connecting the series arrangement of said resistance means and said primary winding across a source of voltage to be measured, the secondary winding output of said current transformer being a function of the voltage at said source of voltage, and

an oscilloscope, said oscilloscope being connected to receive and display the secondary winding output of said current transformer.

4,438,396
LOW COST VOLT/AMPERE METER WITH LIQUID CRYSTAL DISPLAY

John D. Harnden, Jr., and William P. Kornrumpf, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 24, 1981, Ser. No. 286,491
Int. Cl.³ G01R 1/22, 15/08
U.S. Cl. 324—127 23 Claims



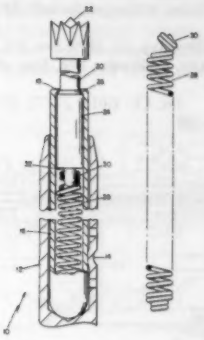
1. A volt/ampere meter comprising:
a flux coupling means;
a plurality of conductors for carrying alternating current to an electrical appliance, one of said conductors establishing a conduction path through said flux coupling means so as to form a primary winding for said flux coupling means;
a secondary winding wound on said flux coupling means and having one end thereof coupled to a second one of said plurality of conductors;
a first plurality of prongs coupled, respectively, to one end of each one of said plurality of conductors, respectively, and adapted to be inserted into a power receptacle;
a socket adapted to receive a second plurality of prongs, each of said plurality of conductors, respectively, electrically coupling each prong of said first plurality, respectively, to each prong of said second plurality, respectively;
liquid crystal display means comprising a plurality of display segments;
switching means adapted to be selectively coupled either to the other end of said secondary winding or to said one of said conductors;
a voltage divider network coupled between said switching means and said second one of said plurality of conductors; and
passive circuit means coupling a separate tap, respectively, on said voltage divider network to a separate segment, respectively, of said liquid crystal display means such that selected segments of said liquid crystal display means are energized in accordance with voltage amplitude on said switching means.

4,438,397
TEST PIN

Jonathon H. Katz, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.

Continuation of Ser. No. 107,027, Dec. 26, 1979. This application Jun. 14, 1982, Ser. No. 388,436
Int. Cl.³ G01R 1/06
U.S. Cl. 324—158 P 2 Claims

1. A test pin comprising:
a tubular shaped housing,
a plunger with a contacting end and a body portion that is slidably mounted within said housing along the longitudinal axis of said housing,
said plunger including, at its other end, a stud having a width in a direction transverse to said axis that is smaller than that of said body portion, and
a spring carried in said housing for yieldingly biasing said plunger along said axis relative to said housing,
said spring including a winding that grips said stud,
said winding being characterized in that it has an axis that is at an angle to the longitudinal axis of said spring when

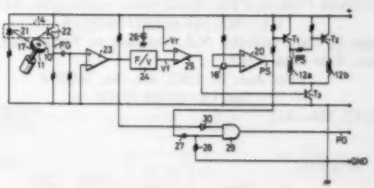


said spring is unstressed so that said spring forces said plunger to one side against an inner surface of said housing,
whereby electrical contact between said plunger and said housing is improved.

4,438,398
POSITION DETECTING SIGNAL GENERATOR

Tsunehiro Maruo, Yokohama, and Masaomi Inagaki, Yachiyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,185
Claims priority, application Japan, Oct. 22, 1980, 55-147706
Int. Cl.³ G01P 3/66, 3/42
U.S. Cl. 324—173 24 Claims



1. Apparatus for generating a phase signal corresponding to a reference phase of a movable body relative to a stationary body, comprising:
position signal generating means associated with at least one of said movable body and said stationary body for generating a position signal corresponding to the position of said movable body relative to said stationary body;
speed signal generating means associated with at least one of said movable body and said stationary body for generating a speed signal corresponding to the speed of movement of said movable body relative to said stationary body;
differentiating means for differentiating one of said position signal and said speed signal to produce a differentiated signal; and
phase signal generating means for generating said phase signal corresponding to a reference phase of said movable body relative to said stationary body in response to said differentiated signal and the other of said position signal and said speed signal.

4,438,399

EDDY CURRENT TESTING DEVICE FOR METAL TUBES OR PIPES HAVING A QUICK RELEASE COUPLING WITH A BAYONET LOCK

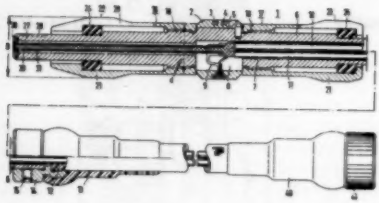
Karl Schnabl; Eberhard Höppner, both of Erlangen, and Hans Kastl, Neustadt, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,549

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837486

Int. Cl.³ G01N *27/72, 27/82*

U.S. Cl. 324—220 5 Claims



1. Probe for eddy-current testing of tubes, the probe having a coil form mechanically and electrically couplable to a thrust hose for moving the probe through the tubes to be tested, comprising an elongated support member having a central cavity containing electrically conductive cables therein, a tubular jacket flexible in radial direction and formed with a plurality of substantially axially extending leaf-springlike fins, said jackets and said fins surrounding said support member and having an end thereof disposed adjacent the coil form and another end thereof facing away from the coil form, a plug forming part of a quick-release coupling with a bayonet lock being located at said other end of said jacket facing away from the coil form and forming a connection for the probe to the thrust hose.

4,438,400

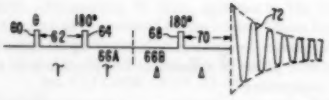
METHOD FOR SUPPRESSION OF ACOUSTIC RINGING IN NMR MEASUREMENTS

Steven L. Patt, Gillette, N.J., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 18, 1982, Ser. No. 340,576

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—312 6 Claims



1. A method of gyromagnetic resonance spectroscopy operative upon an assembly of gyromagnetic resonators immersed in a polarizing magnetic field, said field directed along a first axis, wherein the magnetization vectors of said gyromagnetic resonators precess about said polarizing magnetic field, comprising the steps of

(a) tipping the magnetic vectors 90° from said first axis, said tipping accomplished by rotating said magnetic vector about a second axis, said second axis orthogonal to said first axis and said rotation of selected sense, whereby said magnetic vectors rotate in a plane orthogonal to said first axis,

(b) permitting the progressive loss of phase coherence among said rotating magnetic vectors for an interval of time T,

(c) reversing the sense of rotation of said magnetic vectors by inverting the sense of said first axis through rotation of 180° with respect to said first axis, whereby said progressive loss of phase coherence is reversed,

(d) permitting the progressive approach to phase coherence among said rotating magnetic vectors,

(e) detecting a spin echo resonance signal of said resonators, said signal possibly containing transients of instrumental origin arising from steps (a) and (c),

(f) storing said resonance signal,

(g) repeating the steps (a) and (b) and inverting the sense of said first axis by rotating said coordinate systems through 180° with respect to said first axis, said rotation accomplished about said second axis, said rotation sense opposite said selected sense and repeating the steps (d) through (e),

(h) adding the signal stored in step (f) with the signal detected in step (g) to form a cumulative signal free of transients arising from said 180° rotations of steps (c) and reinversion of step (g),

(i) repeating steps (a) and (b) and inverting the sense of said first axis by rotation of said magnetic vector about a third axis, said axis orthogonal to said first and second axes and said 180° rotation having second selected sense whereby said loss of phase coherence is reversed and repeating again steps (d) and (e),

(j) subtracting the signal detected in step (i) from the cumulative signal obtained at step (h) and storing said cumulative signal,

(k) repeating steps (a) and (b) and inverting the sense of said first axis by rotation of said magnetic vector through 180° about said third axis, said 180° rotation in sense opposite said second selected sense and repeating steps (d) through (e),

(l) subtracting the signal detected in step (k) from said cumulative signal obtained and stored at step (j) and storing said new cumulative signal, whereby ringing incident to step (a) repeated at step (g) is canceled against the ringing experienced at steps (i) and (k).

4,438,401

SYSTEM FOR DETECTING A CABLE BURIED UNDER THE SEABED

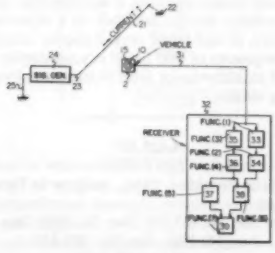
Yoshinao Iwamoto, Fujumi; Shizuo Suzuki, Yokohama, and Yuichi Shirasaki, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 168,402

Claims priority, application Japan, Jul. 31, 1979, 54-98656

Int. Cl.³ G01V *3/08, 3/165, 3/38;* G01B *7/14*

U.S. Cl. 324—326 9 Claims



1. A system for detecting a cable comprising;

(a) means for applying an alternating current in the cable to be detected so as to produce magnetic flux around the cable,

(b) a vehicle

(c) a three dimensional flux detector having three detector elements each having cosine sensitivity characteristics mounted on said vehicle, the maximum sensitivity direc-

tion of each element being perpendicular to one another, and the maximum sensitivity direction of one of the detector elements being directed in the vertical direction,

(d) means for separating the output signals of each of said detector elements into a DC component which is caused by the earth's magnetic field and an AC component which is caused by said alternating current,

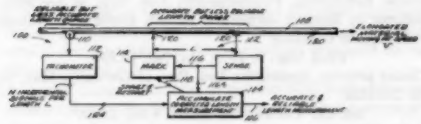
(e) means for determining the direction of the cable from the DC and AC output components of two detector elements which have their directivity in the horizontal plane,

(f) means for determining the horizontal distance and the vertical distance between the cable and the cable detecting system from the AC output signals of each of the detector elements on the principle that the magnitude of the flux is inversely proportional to the distance to the cable and the direction of the flux is in the tangential direction of the circle having the center on the cable.

4,438,402
ELECTROSTATIC TRANSDUCER FOR LENGTH MEASUREMENT SYSTEM

Donald L. Cullen, Worthington, and John A. Robertson, Chillicothe, both of Ohio, assignors to Autech Corporation, Columbus, Ohio

Filed Jun. 26, 1981, Ser. No. 277,845
Int. Cl.³ G01N *27/60*
U.S. Cl. 324—452 **37 Claims**



1. An electrostatic transducer adapted for a length measurement system used to measure the length of material moving along an intended measurement path said transducer comprising:

a corona discharge electrode disposed to be out of contact with said material;

a reference electrode substantially surrounding the intended path of moving material; and

a charge sensing electrode also substantially surrounding the intended path of moving material and disposed a predetermined distance from said corona discharge electrode, said charge sensing electrode being substantially surrounded by said reference electrode, and both said sensing and reference electrodes also being disposed out of contact with the path of relatively moving material.

4,438,403
FAULT INDICATOR WITH COMBINED TRIP AND RESET WINDING

Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60118

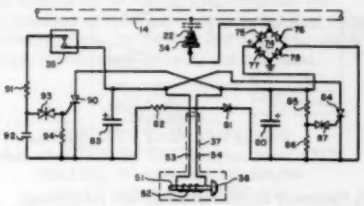
Filed Aug. 4, 1981, Ser. No. 290,012
Int. Cl.³ G01R *19/14, 31/02*
U.S. Cl. 324—133 **17 Claims**

1. A fault indicator for indicating the occurrence of a fault current in an electrical conductor of an alternating current distribution power system, comprising, in combination:

means including a magnetic winding having end terminals for producing a magnetic field in response to an applied current, said field being of one polarity in response to current applied to said winding in one direction between said end terminals, and of opposite polarity in response to current applied to said winding in the opposite direction between said end terminals;

status indicating means in magnetic communication with said magnetic winding, said status indicating means assuming a reset-indicating state in response to the occurrence of a magnetic field of said one polarity in the winding, and assuming a fault-indicating state in response to the occurrence of a magnetic field of said opposite polarity in said winding;

reset circuit means coupled to and operable from alternating current in the electrical conductor for developing a unidirectional current in said magnetic winding between said end terminals in said one direction whereby said status indicating means is conditioned to said reset state; and

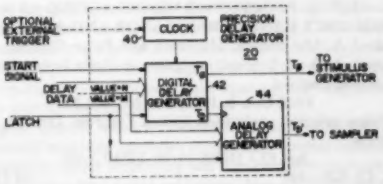


trip circuit means coupled to and operable from alternating current in the electric conductor and responsive to occurrence of a fault current in the conductor during either portion of the alternating current cycle for developing a unidirectional current in said magnetic winding between said end terminals in said opposite direction whereby said status indicating means is conditioned to said fault indicating state.

4,438,404
SIGNAL SAMPLING SYSTEM

Harald Philipp, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 4, 1982, Ser. No. 337,041
Int. Cl.³ H03K *5/13;17/28*
U.S. Cl. 328—63 **12 Claims**



1. A sampling time base, comprising:

means for generating clock edges at a predetermined frequency;

digital timing means for generating a digital delay signal substantially coincident with the Nth clock edge of a predetermined number N of clock edges, thereby establishing a digital timing interval from the first to the Nth clock edge;

analog timing means responsive to said digital delay signal for initiating an analog timing signal substantially coincident with said Nth clock edge; and

means for generating a sampling pulse at the end of a predetermined analog timing interval of said analog timing signal.

4,438,405

FREQUENCY DISCRIMINATING DEVICE

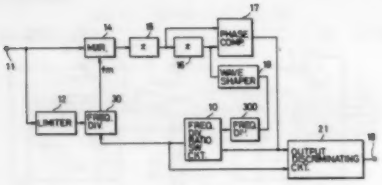
Nobuharu Yazawa, and Yasunori Sakaguchi, both of Itami, Japan, assignors to Nippon Gijutsu Boeki Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1981, Ser. No. 292,273

Claims priority, application Japan, Aug. 12, 1980, 55-110521; Aug. 12, 1980, 55-110525; May 8, 1981, 56-69617

Int. Cl.³ H03B 19/00; H04Q 3/00; H03K 5/26

U.S. Cl. 328—152 10 Claims



1. A frequency discriminating device, comprising:

a first frequency divider for frequency dividing a carrier signal of a received signal which is amplitude-modulated with one of two adjacent frequencies;

a frequency mixer receiving a frequency-divided output from said first frequency divider and said amplitude-modulated signal;

a first low-pass filter coupled to an output of said frequency mixer for passing only a difference component between the frequency of said output of said first frequency divider and the modulation frequency of said amplitude-modulated signal;

a second low-pass filter having an input coupled to an output of said first low-pass filter;

a phase comparator receiving an output of said first low-pass filter and receiving an output of said second filter for detecting a phase difference therebetween;

a second frequency divider for frequency dividing an output of said second frequency filter; and

a frequency division ratio switching circuit receiving a frequency-divided output of said second frequency divider and an output of said phase comparator, for setting a frequency division ratio of said first frequency divider.

4,438,406

SIGNAL PROCESSING MEANS ACTING AS A FREQUENCY RANGE TRANSLATOR AND AS A FILTER

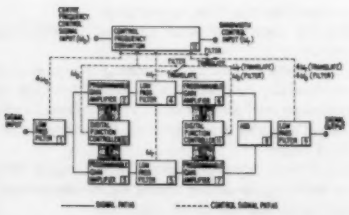
Michael A. McCormick, Hucknall, and Peter Gladdish, Holbrook, both of England, assignors to Rolls-Royce Limited, London, England

Filed Oct. 5, 1982, Ser. No. 432,824

Claims priority, application United Kingdom, Oct. 15, 1981, 8131074

Int. Cl.³ H03B 19/06; H03F 3/68

U.S. Cl. 328—167 14 Claims



1. Signal processing means comprising first filter means arranged to receive an input signal, two first programmable gain amplifier means arranged to receive a signal from the first filter means and controlled by first digital function controller means, second filter means arranged to receive the signals from the two first programmable gain amplifier means, two second programmable gain amplifier means arranged to receive the two signals from the second filter means and controlled by second digital function controller means, means for adding the output signals from the two second programmable gain amplifier means, third filter means arranged to receive the signal from the adding means and control frequency derivator means arrange to control the first, second and third filter means and the first and second digital function controller means, the control frequency derivator means being controlled by a centre frequency control input signal, and a bandwidth control input signal.

4,438,407

INTEGRABLE DEMODULATOR FOR DIGITAL SIGNALS MODULATED ONTO CARRIERS

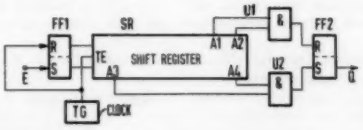
Hartmut Kemmesies, Puchheim-Bhf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 19,136

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1978, 2811488

Int. Cl.³ H03D 3/18; H03K 9/00, 13/00

U.S. Cl. 329—50 6 Claims



5. A demodulator for digital signals modulated onto a carrier as input signals, comprising:

a shift register including a signal input, a clock input and a plurality of outputs;

a clock connected to said clock input and operable to produce clock pulses;

input signal means including a signal receiving input for receiving the modulated digital signals, an output connected to said signal input of said shift register, a bistable flip-flop connected to said clock and to said signal receiving input and controlled by the clock pulses and the modulated digital signals and including a signal output constituting said output of said input signal means, and gating means including a first input connected to said signal receiving input, an output connected to said signal input of said shift register and a second input connected to one of said outputs of said shift register for asynchronous clocking of asynchronously-received input signals;

said input signal means operable to extend the duration of an input signal for said shift register for scanning the input signal in response to said clock pulses;

a flip-flop output circuit; and

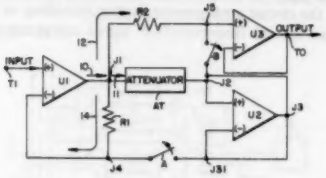
logic means connected to said plurality of outputs of said shift register and to said flip-flop output circuit for combining the signals of said plurality of outputs and operating said flip-flop output circuit.

4,438,408

SIGNAL ATTENUATING APPARATUS

Ambroz K. Skrovanek, Bethesda, Md., and Carl A. Evert, Alexandria, Va., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Aug. 17, 1982, Ser. No. 408,900
Int. Cl.³ H03G 1/00; H03H 7/24
U.S. Cl. 330—51 9 Claims



1. Apparatus for providing a predetermined gain or loss to electrical signals, comprising:

signal attenuating means including an input terminal and an output terminal for attenuating the electrical signals received at the input terminal thereof and providing the attenuated electrical signals at the output terminal thereof,

a feedback circuit coupling the attenuating means output terminal to the attenuator input terminal and including a first switching device for selectively feeding back the attenuated signal to said attenuator input,

output circuit means having an input and an output for producing output signals at the output thereof having amplitudes which are functions of the attenuation provided by said attenuating means,

first circuit means connected in parallel with said attenuating means for coupling said attenuating means input terminal to the input of said output circuit means,

a second switching device selectively connecting said attenuating means output to the input of said output circuit means, whereby said output circuit means selectively feeds the attenuated electrical signal produced by said attenuating means to said input of said output circuit means,

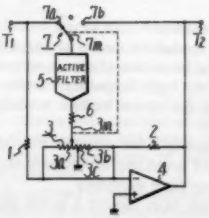
each of said first and second switching devices having an open and a closed state and being operative such that the apparatus provides a gain or loss in amplitude of the electrical signals received thereby.

4,438,409

ACTIVE EQUALIZER

Yasushi Katsumata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,334
Claims priority, application Japan, Feb. 27, 1981, 56-27793
Int. Cl.³ H03F 1/34
U.S. Cl. 330—107 9 Claims



1. An active equalizer for selectively increasing and decreasing to a desired degree the amplitude of selected frequencies of an input signal, comprising:

an input terminal for receiving said input signal and an output terminal for providing an equalized output;

an input resistance;

inverting means having an inverting input connected to said input terminal through said input resistance and an output connected to said output terminal;

a feedback resistance connected between said inverting input and output of said inverting means;

active filter means responsive to said selected frequencies and having at least one filter output and at least one filter input;

means for selectively connecting each said filter input to said input terminal for increasing said amplitude, and to said output terminal for decreasing said amplitude; and

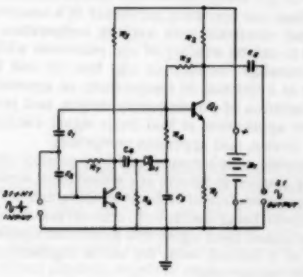
variable resistance means connecting each said filter output to said inverting input for varying said degree to which said amplitude is selectively increased and decreased.

4,438,410

VARIABLE GAIN AMPLIFIER

Laurence E. Orne, 4 Eubar Cir., Billerica, Mass. 01821

Filed Sep. 29, 1981, Ser. No. 306,844
Int. Cl.³ H03G 3/18; H03C 1/26
U.S. Cl. 330—278 3 Claims



1. A variable gain amplifier apparatus comprising in combination:

a first and second transistor amplifier means to receive an input signal, said input signal comprising an AC input signal and a noise signal, said first and second transistor amplifier means respectively having an input terminal, said input terminal of said first transistor amplifier means being connected to said input terminal of said second transistor amplifier means by a first and second capacitor, the common junction of said first and second capacitor forming an input terminal, said input signal being applied to said input terminal,

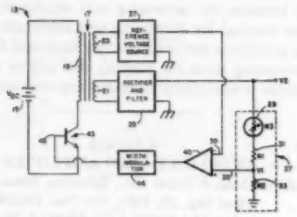
a signal detector means connected to the output of said second transistor amplifier means, said second transistor amplifier means amplifying said input signal to provide an amplified output signal, said signal detector means receiving said amplified output signal from said second transistor amplifier means, said signal detector means rectifying said amplified output signal to provide DC voltages in response thereto,

a charge storage means connected to said signal detector means to receive said DC voltages, said charge storage means storing said DC voltage to provide a DC bias voltage to the input of said first transistor amplifier means, said DC bias voltage varying directly with said input signal, said first transistor amplifier means providing an output voltage in response to said input signal and said DC bias voltage, said first transistor amplifier means maintaining a constant input/output signal ratio over a wide dynamic range of said input signal.

4,438,411
TEMPERATURE COMPENSATING METHOD AND APPARATUS FOR THERMALLY STABILIZING AMPLIFIER DEVICES

Michael D. Rubin, Saratoga, and Pang T. Ho, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Jul. 20, 1981, Ser. No. 284,755
Int. Cl.³ H03F 3/04
U.S. Cl. 330—289 **10 Claims**



1. For use in a power supply to an amplifier device, said amplifier device being operative to exhibit monotonic instability of at least one operating parameter at a constant bias on a large signal electrode with varying temperature and being operative to exhibit stability of said parameter with pre-determined controlled variation of said bias on said large signal electrode as a function of temperature, an apparatus for controlling variation of power supply output, said power supply output for application at said large signal electrode of said amplifier device, said apparatus comprising:

bias monitor circuit means, said bias monitor circuit means being coupled to receive as a sensed input signal a parameter representative of ambient temperature, said bias monitor circuit being operative to convert said ambient temperature sensed input signal into an electric signal representative of a thermal value for use in regulating said power supply output; and

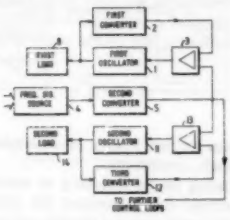
feedback signal generating means, said feedback signal generating means being coupled to receive said electric signal for varying said power supply output to follow said predetermined controlled variation of electrode bias on said large signal electrode as a function of temperature, wherein said feedback signal generating means includes a DC-to-DC converter circuit comprising a DC source, a switching means for chopping said source to form and AC voltage waveform, and rectifier and filter means to convert said AC voltage waveform to a DC output voltage, and wherein said feedback signal generating means further comprises a reference voltage source, a voltage comparator circuit connected to compare said control signal with said reference voltage source and to generate an error signal, a width modulator circuit connected to receive said error signal and, in response to said error signal, to control the pulse width of output signals of said switching means.

4,438,412
OSCILLATOR FREQUENCY CONTROL LOOP

Christopher W. Malinowski, and Heinz Riederle, both of Heilbroan, Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Continuation of Ser. No. 85,333, Oct. 16, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 346,994
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2844936; Oct. 16, 1978, 2844939; Oct. 16, 1978, 2844938; Oct. 16, 1978, 2845005; Oct. 16, 1978, 2845006
Int. Cl.³ H03L 7/16
U.S. Cl. 331—2 **7 Claims**

1. In a circuit arrangement including at least one control loop composed of a controllable oscillator for producing an a.c. output signal whose frequency is a function of the value of a control signal thereto, a frequency/d.c. signal converter connected for producing a d.c. output signal which is a function of the frequency of the oscillator output signal, a signal comparator having two inputs and an output, first signal conducting means connected for applying to one comparator input a signal corresponding in value to the converter output signal, and connecting means connected for applying to the oscillator a control signal corresponding to the signal at the comparator output, the circuit arrangement further including an a.c. signal source, a second frequency/d.c. signal converter connected

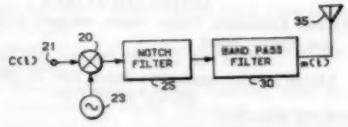


for producing a d.c. output signal which is a function of the frequency of the a.c. signal produced by the source, and second signal conducting means connected for applying to the other comparator input a signal corresponding in value to the second converter output signal, the improvement wherein there are at least two said control loops, and said second conducting means comprises adjustable signal control means connected between the output of said second converter and the other input of said comparator of each said loop for applying to each said associated comparator input a signal which differs in value from and varies in proportion with the output signal from said second converter.

4,438,413
SERIAL MINIMUM SHIFT KEYED MODULATOR INCLUDING NOTCH AND BANDPASS FILTERS

Carl R. Ryan, Gilbert, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 29, 1981, Ser. No. 268,419
Int. Cl.³ H03C 3/00; H04L 27/12
U.S. Cl. 332—16 R **10 Claims**



1. A serial minimum-shift keyed modulator comprising:

(a) biphase modulator means having a first input for receiving a serial bit stream of data, a second input for receiving a relatively high frequency carrier, and an output for supplying the carrier biphase modulated by the serial bit stream;

(b) a conversion filter coupled to said biphase modulator means and providing a minimum-shift keyed signal, said conversion filter including

(1) a notch filter having a notch adjacent to the carrier frequency and in the frequency spectrum of the biphase modulator, and

(2) a bandpass filter having a bandpass positioned to extend above and below the carrier frequency for the biphase modulated carrier, said notch and bandpass

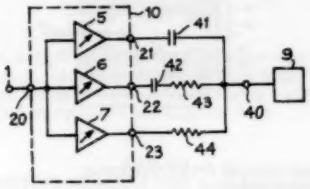
filters being coupled together to form the conversion filter.

4,438,414

TONE CONTROL CIRCUIT

Denis Blachot, Haussmann, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 12, 1981, Ser. No. 320,494
Claims priority, application France, Nov. 14, 1980, 80 24231
Int. Cl.³ H03H 7/03
U.S. Cl. 333—28 T 6 Claims



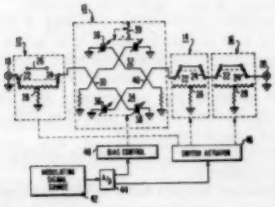
1. A tone control circuit for connecting an input terminal with a high impedance input circuit, said tone control circuit including at least two parallel channels with each of said channels including an electronic potentiometer having a low impedance output wherein each of said at least two parallel channels further comprises, a passive filter with each passive filter comprising a series element and a parallel element wherein said series element is connected between the output of each electron potentiometer and said high impedance circuit in such a manner that said parallel element of each of said filter is formed by the parallel association of the series elements of the other of said passive filters of said at least two parallel channels.

4,438,415

DIGITAL PROGRAMMABLE ATTENUATOR

Samuel Hopfer, Brooklyn, N.Y., assignor to General Microwave Corporation, Farmingdale, N.Y.

Filed Jan. 29, 1982, Ser. No. 343,737
Int. Cl.³ H01P 1/22
U.S. Cl. 333—81 A 20 Claims



1. A digital programmable attenuator for microwave signals over a broad band of frequencies, said attenuator comprising:

a programmable phase shiftless resistive pad attenuator for switching large steps of attenuation including a plurality of pads of thin resistive films corresponding to said different large steps of attenuation, and means for switching at high speed different combinations of said resistive pads into and out of operation;

a programmable broadband phase-controlled attenuator for switching a plurality of small steps of attenuation, including means for controlling at high speeds the phase thereof to establish said small attenuation steps;

means for digitally programming the actuation of said attenuators into operation separately and together, including means for actuating said resistive pad attenuator to switch said combinations of thin film pads into and out of operation to establish said large attenuation steps, and for actuating the phase-controlling means of said phase-controlled attenuator to establish said small attenuation steps;

and means for connecting said attenuators in tandem to combine said large and small attenuation steps;

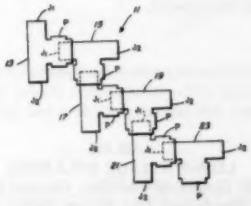
whereby a range of attenuation over a broad frequency band is provided with said small steps established monotonically between said large attenuation steps and with high resolution and accuracy.

4,438,416

PICOSECOND DELAY DEVICE

Norman H. Schiller, Queens, and Robert R. Alfano, Bronx, both of N.Y., assignors to Hamamatsu Corporation, Middlesex, N.J.

Filed Jan. 25, 1982, Ser. No. 342,486
Int. Cl.³ H01P 9/00
U.S. Cl. 333—160 8 Claims



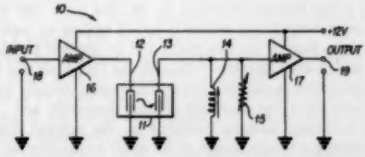
1. A delay device for use in delaying the time of arrival of an electrical signal at fixed increments in the picosecond range and starting at a time interval in the picosecond range, said delay device comprising a plurality of three port electrical connectors fixedly coupled together in series relationship, the construction and physical length of each port of each connector being such as to produce a time delay in the picosecond range of an electrical signal passing through, whereby an electrical signal introduced into any one port and emerging through any other port will be delayed in time in accordance with the total number of ports through which the signal is passed.

4,438,417

FILTER CIRCUIT UTILIZING A SURFACE ACOUSTIC WAVE FILTER

Kiyofumi Yamashita, Yokosuka, and Toshikazu Kodama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 17, 1981, Ser. No. 274,426
Claims priority, application Japan, Jun. 17, 1980, 55-80865; Feb. 25, 1981, 56-25445
Int. Cl.³ H03H 9/125, 9/64
U.S. Cl. 333—193 3 Claims



1. A surface acoustic wave band-pass filter circuit comprising: a surface acoustic wave filter device including a piezoelec-

tric substrate, and a uniform transducer and a weighted transducer which are disposed apart each other on a surface of the substrate, the uniform transducer comprising a first comb electrode and a second comb electrode, the first comb electrode having a first plurality of finger electrodes, and a first bus bar, bridging each end of said first plurality of electrodes, said second comb electrode having a second plurality of electrodes, said second plurality of electrodes being one less than the number of finger electrodes of a comb of a uniform transducer of a surface acoustic wave filter device designed to represent a frequency response which has a constant amoount of attenuation in a transmit band of the device, and a second bus bar bridging each end of said second plurality of finger electrodes,

an inductance element connected to the weighted transducer of the surface acoustic wave device to compensate a capacitance existing in the transducer connected to the industance element; and

means for adjusting Q-factor of the resonant circuit formed by said inductance element and the capacitance of the surface acoustic wave filter device and for optimizing a flatness of a frequency response in the pass band of the band pass filter circuit.

4,438,418

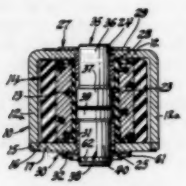
LOW-WATTAGE SOLENOID

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to Mac Valves, Inc., Wixom, Mich.

Filed Jul. 19, 1982, Ser. No. 399,784

Int. Cl.³ H01F 7/08

U.S. Cl. 335—255 **3 Claims**



1. A solenoid assembly, including, a support frame having a transverse member and a pair of leg members, a solenoid coil mounted within the support frame, a flux plate releasably mounted between the support frame leg members for retaining the solenoid coil in the support frame, a pole piece movably mounted in one end of an axial bore through the solenoid coil and through the flux plate, a solenoid armature movably mounted in the other end of said axial bore through said solenoid coil, and guide means for guiding the movement of the pole piece and armature in the axial bore through the solenoid coil, characterized in that said guide means includes:

(a) a first bushing mounted on the flux plate, and having a transverse flange which is seated against an outer transverse face of the flux plate, and an integral tubular body which extends inward through the flux plate and into the axial bore in the solenoid coil and telescopically along the pole piece and in sliding contact therewith; and,

(b) a second bushing mounted on the support frame and having a flange seated on an outer transverse face of the support frame transverse member and an integral tubular body that extends inward through the support frame transverse member and telescopically along the solenoid armature and in sliding contact therewith.

4,438,419

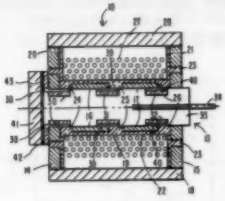
SERIAL RING ACTUATOR

Edward F. Helinski, Johnson City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,486

Int. Cl.³ H01F 7/08

U.S. Cl. 335—261 **9 Claims**



1. A linear solenoid device comprising

stator means including

a plurality of magnetizable annular stator pole members having aligned central openings including a pair of end stator pole members and at least one intermediate pole member axially spaced from and separated by axial gaps between said end pole members,

flux generating means comprising a single cylindrical coil means between said end pole members and surrounding said intermediate pole member,

said cylindrical coil means having a central opening coaxial with said central openings of said stator pole members,

means including casing means forming a magnetic path between said end pole members for flux generated by said coil means when energized, and

armature means freely movable axially within said central opening of said pole members and said coil means including

a plurality of magnetizable annular armature pole elements disposed in axially spaced relationship,

said armature pole elements being concentric with said stator pole members so as to form a plurality of axially spaced annular air gaps with said stator pole members,

said armature pole elements being dimensioned and arranged to be received simultaneously in said central openings of said stator pole members,

said armature pole elements having a length whereby when said armature means is at a rest position said armature pole elements each have a portion at one end in a partial overlap relationship with one of said stator pole members and an opposite end having an axial separation from the near edge of an adjacent one of said stator pole members, and

an armature support body axially spacing said armature pole members,

said armature support body having portions of non-magnetizable material separating said armature pole elements.

4,438,420

ELECTROMAGNETIC ACTIVATION DEVICE

Heinz Leiber, Oberriexingen, and Alwin Stegmeier, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 423,578

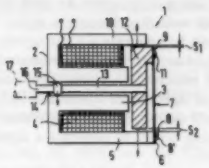
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3107619

Int. Cl.³ H01F 7/08

U.S. Cl. 335—275 **10 Claims**

1. An electromagnetic activation device for valves comprising a magnetic body, a hinged armature fastened on one side to

said body and a valve actuation rod connected to said armature, a leaf spring connected at one end to said magnetic body and having a free end, said hinged armature attached to said



free end of said leaf spring having an attachment point on one side of a single pole magnetic body and said hinged armature extends into the magnetic body while leaving a guide air gap between said armature and said magnetic body.

4,438,421

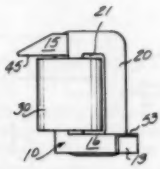
MOUNTING BRACKET FOR A TRANSFORMER

Earl A. Leach, Jr., Masonville, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 24, 1982, Ser. No. 423,355

Int. Cl.³ H01F *15/02*

U.S. Cl. 336—65 **6 Claims**



1. A mounting bracket for a transformer of the type having a core structure having a center opening and a winding wound around a portion of said core, the improvement wherein said bracket comprises:

a U-shaped base portion having a foreward end and a rearward end;

a vertical channel extending upwardly from the forward end of said U-shaped base portion;

first and second members extending forwardly from a respective outer side of the upper portion of said vertical channel, said first and second members including respective downwardly facing surface portions disposed in the same plane; and

third and fourth members extending outwardly from a respective outer side of the rear portion of said U-shaped base portion, said third and fourth members including respective upwardly facing surface portions, located in a plane parallel to the plane in which the first and second members are located.

4,438,422

WARNING METHOD AND SYSTEM FOR VEHICLES

Tadao Nojiri, Oobu; Kenji Kanemaru, Chiryu; Takayoshi Nishikawa, Kariya; Masahiro Matsuyama, Kariya, and Yoji Ito, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 26, 1981, Ser. No. 296,253

Claims priority, application Japan, Sep. 5, 1980, 55-123821

Int. Cl.³ B60Q *5/00*; G08B *21/00*

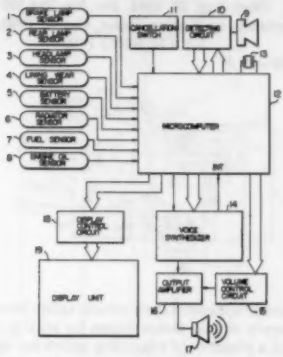
U.S. Cl. 340—52 F **7 Claims**

1. A warning method for vehicles comprising the steps of:

detecting the condition of each of a plurality of items of a vehicle which are to be monitored;

displaying, inside a vehicle compartment of said vehicle, a faulty condition when a faulty condition of at least one of said items is detected by said detecting step;

measuring the lapse of time after the display of said faulty condition is initiated by said displaying step; and



generating a voice to give a warning of said faulty condition inside said vehicle compartment when the lapse of time measured by said measuring step exceeds a predetermined time.

4,438,423

DEVICE FOR PRODUCING AN OPTICAL OR ACOUSTIC SHIFT INSTRUCTION

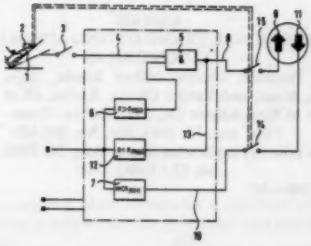
Bernhard Stier, Kelkheim-Fischbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 22, 1982, Ser. No. 350,973

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108920

Int. Cl.³ B60Q *1/26*; B60K *23/00*

U.S. Cl. 340—52 R **7 Claims**



1. In a device for producing an optical or acoustic shift instruction in which a speed-of-rotation signal is fed to a first threshold switch for connecting an upshift signal indicator and to a second threshold switch for connecting a downshift signal indicator, the device being adapted to cooperate with a gas pedal of a vehicle, the improvement comprising

an AND gate arranged behind the first threshold switch,

a gas-pedal position switch being connected to said AND gate at an input side of the latter such that when the gas pedal is depressed only slightly it is connected to the upshift signal indicator, and

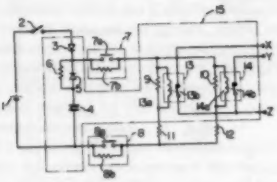
means comprising a third threshold switch in parallel to the two other said threshold switches, being connected directly with said upshift signal indicator and for becoming conductive when the maximum permissible speed of rotation is reached.

4,438,424

ELECTRIC APPARATUS FOR A VEHICLE SAFETY DEVICE

Toshio Yasui, Anjo, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 20, 1981, Ser. No. 294,555
Claims priority, application Japan, Oct. 2, 1980, 55-138141
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—52 H **7 Claims**



1. An electric apparatus for a vehicle safety device including a power supply circuit, sensor means for sensing collision of a vehicle, and a plurality of triggering means fed by said power supply circuit through said sensor means for triggering at least one vehicle safety device upon actuation of said sensor means, said electric apparatus comprising:

a plurality of resistors;

a plurality of recorder means each thereof comprising electric circuit means connected in parallel with one of said plurality of resistors and for actuation by a high potential difference across said one of said plurality of resistors, the recorder means being actuated when a large electric current flows through said one of said plurality of resistors by way of an associated one of said plurality of triggering means upon the actuation of said sensor means, and permanently remains in the actuated state;

said plurality of resistors having one end thereof connected in common to an end of said sensor means and the other end thereof connected to one of said plurality of triggering means and

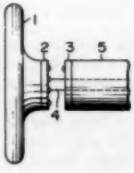
output terminals connected to outputs of said electric circuit means of said plurality of recorder means.

4,438,425

MULTIPLE SIGNAL TRANSMITTING APPARATUS FOR AUTOMOBILES

Takashi Tsuchida, Chiryu; Nobuo Kondo, Anjo; Kazukiyo Okada, Kosai, and Yutaka Okuda, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 14, 1981, Ser. No. 292,431
Claims priority, application Japan, Aug. 21, 1980, 55-114923
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—55 **7 Claims**



1. A multiple signal transmitting apparatus for automobiles comprising:

a plurality of switches mounted on a steering wheel of an automobile;

a multiplexing circuit mounted on said steering wheel for multiplexing signals from said switches to generate a multiplexed signal;

at least one light-emitting means mounted on a surface of said steering wheel facing a means for supporting said steering wheel, said light-emitting means being assigned with a discrimination signal which differs depending on a mounting location on the steering wheel, said light-emitting means being responsive to said multiplexed signal together with said discrimination signal from said multiplexing circuit to generate a light signal;

at least one light-sensitive means mounted on a surface of said support means facing said light-emitting means for receiving said light signal when said light-emitting means is aligned with said light-receiving means due to a rotation of said steering wheel to generate a signal corresponding thereto; and

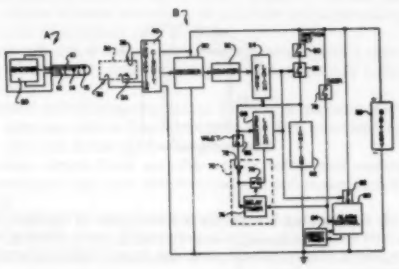
a decoder circuit arranged on a vehicle body of said automobile for decoding an output signal of said light-sensitive means to generate signals corresponding to the signals from said plurality of switches and said discrimination signal indicative of a rotational position of said steering wheel.

4,438,426

ELECTRONIC KEY ANTI-THEFT SYSTEM

Joey B. Adkins, Willowick, Ohio, assignor to Darrell E. Issa, Cleveland, Ohio

Filed Oct. 22, 1981, Ser. No. 313,820
Int. Cl.³ B60R *25/04*
U.S. Cl. 340—64 **14 Claims**



1. A passive-instant vehicular anti-theft system comprising:

an alarm control means for selectively actuating and deactuating an alarm device;

entry detecting means for detecting entry into the vehicle, the entry detecting means being connected with the alarm control means to actuate the alarm device substantially immediately upon entry into the vehicle, whereby the anti-theft system is instant;

a decoder means for decoding encoded signals, the decoder producing an enable signal in response to decoding a signal encoded with a preselected code signal;

ignition enabling means for selectively enabling an ignition to be operated, the ignition enabling means being operatively connected with the decoder means to enable the ignition in response to the enable signal;

an alarm disabling means for selectively disabling the alarm control means, the alarm disabling means being operatively connected with the decoder means to disable the alarm in response to the enable signal;

automatic reset means for causing the ignition enabling means to disable the ignition and the alarm disabling means to enable the alarm control within a preselected duration of ceasing operation of the ignition, whereby the anti-theft system is passive;

an electrical jack mounted to receive an electric plug from the exterior of the vehicle, the jack being operatively connected with the decoder means such that the decoder is adapted to receive encoded signals therefrom; and

an electronic key including an encoder means which pro-

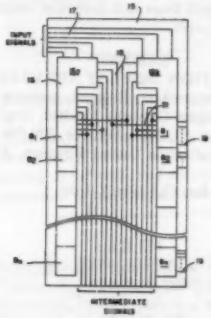
duces a signal encoded with said preselected code and a plug which is adapted to be received in the jack such that the encoder is operatively connected with the decoder, whereby the anti-theft system is undefeatable by mechanical lock picking, hot wiring, short circuiting, or the like.

4,438,427

DECODER AND METHOD UTILIZING PARTIAL AND REDUNDANT DECODING

Kenichi Miura, Saratoga, Calif., assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 20, 1978, Ser. No. 926,950
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **12 Claims**



1. In a method for decoding a digital input signal having a plurality of bits, the steps of: partially decoding the input signal by combining predetermined ones of the bits together to provide intermediate signals corresponding to decoded subsets of the input signal, at least one of the predetermined bits of the input signal being included in more than one of the subsets of said signal, applying the intermediate signals to a plurality of bus lines which extend past a plurality of logic blocks, and combining in the logic blocks predetermined ones of the intermediate signals from the bus lines to provide output signals as a predetermined decoding of the input signal.

4,438,428

MULTIPLE FUNCTION PERSONAL SECURITY ALARM

John W. Ober, Hiram, Ohio, and John M. Ferry, Garrett, Ind., assignors to Omnitronics Research Corporation, Barberton, Ohio

Filed Feb. 20, 1981, Ser. No. 236,242
Int. Cl.³ G08B *19/00, 17/00*
U.S. Cl. 340—521 **29 Claims**

1. An alarm having multiple functions for the security of an individual within a preselected area, the alarm having a board mounting substantially all electrical components, comprising:

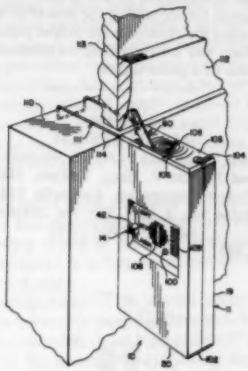
switch means for selecting among the functions the alarm performs;

smoke detection means for optically detecting the presence of smoke in the preselected area including a light source for generating light, a light sensor for detecting light and opaque chamber means, said light sensor being positioned within said opaque chamber means in substantially perpendicular alignment to a longitudinal axis of transmission of light through said opaque chamber means from said light source, said opaque chamber means receiving light from said light source and isolating said light sensor from detecting light from said light source;

intrusion detection means for detecting an unauthorized intrusion into the preselected area;

alarm means for communicating to the individual the presence of a potential security threat; and

plate assembly means housing said switch means, said intrusion detection means, and said alarm means and being secured to the board, said plate assembly means defining said opaque chamber means for permitting the transmis-



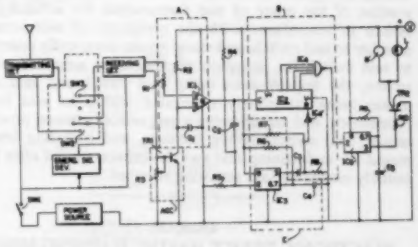
sion of light from said light source to said light sensor upon the presence of a preselected concentration of smoke in said opaque chamber means from the preselected area.

4,438,429

EMERGENCY SIGNAL TRANSCEIVER FOR DISABLED CAR

Seung M. Park, 210-29 Itaewon-dong, Yongsan-ku, Seoul, Rep. of Korea

Filed Oct. 5, 1981, Ser. No. 308,907
Int. Cl.³ G08B *1/08*
U.S. Cl. 340—539 **6 Claims**



1. An emergency alarm system for a vehicular radio transceiver having a transmitter unit, a receiver unit and an antenna comprising:

comparator means for deriving as an input from said receiver a repetitive series of digital pulses;

automatic gain control means, connected to receive the output signal of said receiver, to adjust the noise level of the output signal and to couple the adjusted signal to the comparator means as a reference level input signal;

first multivibrator means coupled to receive the output of said comparator means as an input and to provide a series of pulse signals of predetermined duration as an output signal;

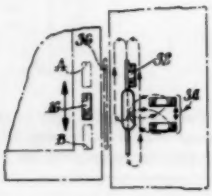
counter means, coupled to receive as inputs the output of said comparator means and the output of said first multivibrator means, for counting the output pulses from said comparator means to determine when a preselected number of pulses has been received and for passing a digital pulse and the output pulse of said first multivibrator to a pair of its output terminals at this time;

NAND gate means for receiving the outputs of said counter and providing an output signal therefrom;
second multivibrator means for providing a pulse output in response to the output signal of said NAND gate;
driver means, to which the output of said second multivibrator is coupled, for increasing the power of its input signal;
indicating means for receiving the output pulse signal of said driver means and for providing an external indication of its reception of a pulse signal.

4,438,430
ALARM SYSTEM

Alfred G. Young, Joppa, Md.; Leon F. Slocomb, Jr., Wilmington, Del., and Francis V. Bugg, Towson, Md., assignors to Acroseal Window Corporation, Annapolis, Md.

Filed Sep. 3, 1981, Ser. No. 299,069
Int. Cl.³ G08B *13/08*
U.S. Cl. 340—547 **11 Claims**

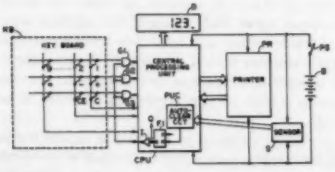


1. In an alarm system for detecting the unauthorized movement of a closure member which selectively opens and closes an opening wherein a fixed framework is associated with said opening and a movable framework is associated with said closure member and wherein at least a portion of each of said fixed framework and said movable framework is hollow, said alarm system including a switch mounted in one of said frameworks, a magnetic actuating member mounted in said hollow portion of the other of said frameworks for actuating said switch in accordance with the proximity of said actuating member to said switch, and alarm means electrically connected to said switch for actuation thereby upon actuation of said switch, the improvement being said switch and said alarm means being completely concealed within its said hollow framework, said switch being a magnetically biased proximity sensor, said switch having contacts, and including latching means for maintaining said switch contacts closed after being initially closed by said actuating member.

4,438,431
ELECTRONIC DEVICE HAVING WARNING MEANS

Shigeru Toyomura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1981, Ser. No. 262,959
Claims priority, application Japan, May 16, 1980, 55-65712
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—663 **2 Claims**

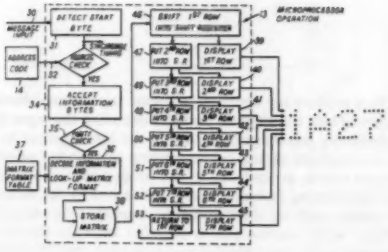


1. An electronic device for producing a warning comprising:
key input means for introducing data signals as input data into said electronic device, said key input means including a clear-key for introducing a clear-signal into said electronic device to clear the input data;
printing means for printing an output related to the input data in said key input means;
power source means for supplying electric power to said printing means;
detection means for detecting an output related to the electric power supplied from said power source means, and for generating a signal based on the detection; and
means for inhibiting data input from said key input means into said printing means upon receipt of the detection signal from said detection means,
wherein said inhibiting means includes a plurality of gate circuits which prevent said key input means from introducing data signals when said inhibiting means is receiving the detection signal from said detection means.

4,438,432
INFORMATION DISPLAY APPARATUS

Ivan B. Hurcum, Chippenham, England, assignor to Westinghouse Brake and Signal Company Limited, England

Filed Dec. 29, 1980, Ser. No. 220,894
Claims priority, application United Kingdom, Jan. 19, 1980, 8001871
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.35 **8 Claims**



1. An information display system comprising a mimic diagram having a plurality of locations for the selective display of information, each said location having a unique address code, multiplex data transmission means linking said locations to information supply means arranged to supply multiplexed messages consisting of an address code portion and a message portion, a connector socket mounted in the diagram at each said location, a plurality of interchangable standard plug-in display module assemblies each comprising a connector plug for mating with any one of the connector sockets, said plug being connected to address comparison means for, responsive to a correct address, gating a message information portion through information gating means to information decoding means connected to drive information display means, each module assembly further including an address programming means which is settable to provide the correct address to said comparison means corresponding to that allocated to the particular location at which the module assembly is plugged-in.

4,438,433
MULTIADDRESS PAGER WITH A CALL STORAGE AND PRIORITY PAGING OPTION

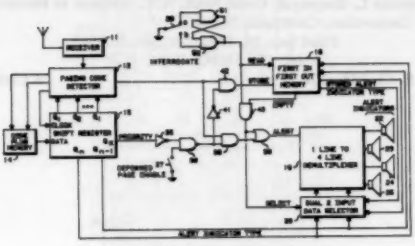
George W. Smoot, Sunrise, and Philip P. Macnak, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1981, Ser. No. 306,799
Int. Cl.³ G08B *5/22*
U.S. Cl. 340—825.44 **17 Claims**

1. A pager for receiving similarly-coded incoming calling signals which include user-designated emergency-type calls

and non-emergency-type calls, wherein the emergency-type calls require immediate response and non-emergency-type calls can be responded to later at the convenience of the user of the pager, comprising:

means for decoding incoming signals and for distinguishing



decoded emergency-type calls from non-emergency type calls;

means for generating an alert signal in response to an emergency-type call; and

means for storing an indication of non-emergency-type calls for the generation of a subsequent alert signal.

4,438,434

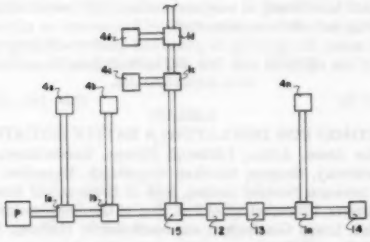
SELF-SEQUENCING DATA BUS ALLOCATION SYSTEM

Thomas D. Wason, Raleigh, N.C., assignor to Cain Encoder Company, Greenville, N.C.

Filed Jul. 27, 1981, Ser. No. 287,396

Int. Cl.³ H04Q 9/00

U.S. Cl. 340—825.51 **8 Claims**



1. A self-sequencing data bus allocation system for obtaining data from a plurality of data communication devices in accordance with a prescribed sequence and without separately addressing each data communication device, said data communication devices being of the type which are activated by the receipt of power at a prescribed level to transmit data out along a data line, then become deactivated when all available data has been transmitted and cease to draw current, said system comprising:

(a) an electrical power source having a multi-line, main electrical cable emanating therefrom;

(b) said multi-line, main electrical cable including a supply line and at least one data line;

(c) a plurality of multi-line electrical cable branches, each of said branches having at least a supply line and at least one data line connecting the corresponding lines of said main electrical cable with one of said data communication devices;

(d) a plurality of control means, each of said control means being connected to at least the supply line in one of said cable branches, whereby said power source is connected by said control means with a first one of said control means for the activation of the corresponding data communication device and thereafter interconnected with the succeeding downstream control means;

(e) each of said control means including:

(i) a switching means positioned in the cable branch supply line between said main cable supply line and said communication device being served by said branch cable and being operable between a normal "off" position and a second "on" position responsive to the receipt of a prescribed signal for temporarily connecting said corresponding data communication device to said main electrical cable and supplying power thereto;

(ii) a current sensing means in said cable branch supply line for detecting the level of current being supplied to the corresponding one of said data communication devices;

(iii) a control signal being generated by said current sensing means and transmitted through said main cable to the switching means of the next downstream control means responsive to a drop in the current below a prescribed level; and

(iv) the switching means of the control means corresponding to the communication device which has just been read being returned to said normal "off" position responsive to the sensing by said sensing means that the current through said branch cable has dropped below a prescribed level.

4,438,435

TWO-WAY RANGING SYSTEM

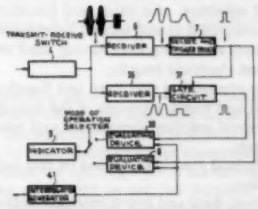
Günter Höfgen, Kornwestheim, and Hinrich Ecklundt, Ludwigsburg, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,342

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1980, 3027823

Int. Cl.³ G01S 9/02

U.S. Cl. 343—7.3 **18 Claims**



1. A two-way ranging system comprising:

an interrogator to transmit an interrogation signal to a transponder, said transponder transmitting a reply signal to said interrogator after a fixed delay following the reception of said interrogation signal, said interrogation signal and said reply signal each including, as transmitted and as received, a pulse pair having a predetermined spacing therebetween and a third pulse spaced from said pulse pair a predetermined time interval, said third pulse having a leading edge steeper than the leading edge of the pulses of said pulse pair; and

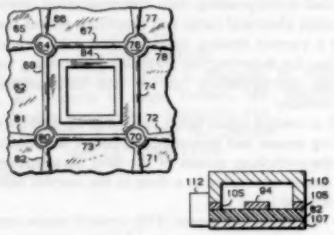
evaluating means disposed in said interrogator responsive to said third pulse in each of said interrogation signal and said reply signal to provide a distance measurement between said interrogator and said transponder, said distance measurement and said reply signal being accomplished only if said pulse pair has said predetermined spacing and said third pulse is spaced from said pulse pair said predetermined interval.

4,438,436

MILLIMETER WAVE MONOPULSE COMPARATOR CIRCUIT

Earl R. Murphy, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 4, 1981, Ser. No. 327,334
Int. Cl.³ G01S 13/00
U.S. Cl. 343—16 M 3 Claims



1. In a millimeter wave radar system of the type having a monopulse antenna array comprising four antenna elements and a guidance system for utilizing monopulse guidance signals, a millimeter wave monopulse comparator comprising:

a low dielectric constant substrate having a ground plane disposed on a first side thereof;

a first hybrid junction disposed on a second side of said substrate;

first and second microstrip lines disposed on said second side of said substrate, said first and second microstrip lines being connected to said first hybrid junction, said first and second microstrip lines having first and second predetermined electrical lengths;

means for connecting said first and second microstrip lines to first and second elements of the monopulse antenna;

a second hybrid junction disposed on said second side of said substrate;

third and fourth microstrip lines disposed on said second side of said substrate, said third and fourth microstrip lines being connected to said second hybrid junction, said third and fourth microstrip lines having third and fourth predetermined electrical lengths;

means for connecting said third and fourth microstrip lines to third and fourth elements of the monopulse antenna;

a third hybrid junction disposed on said second side of said substrate;

a fourth hybrid junction disposed on said second side of said substrate;

first, second, third and fourth interconnection lines disposed on said second side of said substrate connecting said first, second, third and fourth hybrid junctions, said first, second, third and fourth microstrip lines lying external to a closed figure formed by said interconnection lines and said hybrid junctions, said interconnection lines being short, straight, high impedance microstrip lines;

fifth and sixth microstrip lines disposed on said second side of said substrate, said fifth and sixth microstrip lines being connected to said third hybrid junction and being external to said closed figure;

seventh and eighth microstrip lines disposed on said second side of said substrate, said seventh and eighth microstrip lines being connected to said fourth hybrid junction and being external to said closed figure;

channel lines disposed on said second side of said substrate running substantially parallel to said microstrip lines and said interconnection lines;

channel means in contact with said channel lines for forming a conductive enclosure of predetermined dimensions about said microstrip lines and said interconnection lines; and

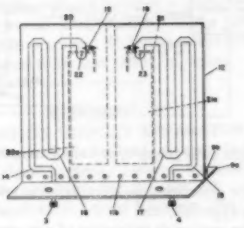
means for connecting said fifth, sixth, seventh and eighth microstrip lines to said monopulse guidance system.

4,438,437

DUAL MODE BLADE ANTENNA

Patricia L. Burgmyer, Great Neck, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,542
Int. Cl.³ H01Q 13/16, 1/28
U.S. Cl. 343—770 6 Claims



1. An antenna for radiating a signal of given wavelength comprising:

(a) a printed circuit board having first and second opposing sides;

(b) first and second folded slat monopoles on the first side of said board and spaced apart by less than one-quarter of the given wavelength;

(c) first and second microstrip feed lines on the second side of said board, said first line terminating in a first radiator port associated with said first monopole and said second line terminating in a second radiator port associated with said second monopole; and

(d) means for applying in-phase and quadrature components of the signal to said first and second lines, respectively.

4,438,438

METHOD FOR DISPLAYING A BATTLE SITUATION

Egidius Arens, Achim; Christoph Hampe, Ganderkesee; Ingo Karlowsky, Bremen; Manfred Meyersieck, Daverden; Hans D. Schwarz; Norbert Anding, both of Bremen, and Reinhard Leisterer, Lilienthal, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 219,819
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952315
Int. Cl.³ G01S 3/02
U.S. Cl. 343—451 15 Claims

1. Method for displaying a battle situation under consideration and indication of the movement and position of friendly forces and with the position and motion behavior of targets being determined from angle and distance information derived at the observing or display station, comprising the steps of:

providing an electronic display device for the display of said battle situation;

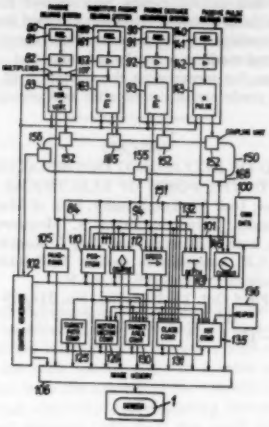
furnishing angle and distance information of targets which radiate wave energy by means of at least one passive bearing and distance measuring system;

from said angle and distance information, calculating the position, course and speed of every target per time interval and indicating the calculated position, course and speed on said display as respective motion vectors;

determining the path of the targets from given time intervals from said angle and distance information about the targets, and displaying the determined target paths on said display device;

associating specific markers with the targets as a result of

determined changes in position of the targets and determined characteristics of signals received from the passive bearing and distance measuring systems, and displaying said markers at the associated target positions; and



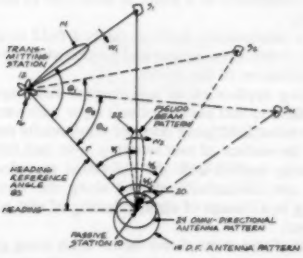
calculating uncertain measurement regions for the position of each target from the measuring tolerances of the angle and distance information and displaying said uncertain measurement region around the displayed marker for the associated target.

4,438,439

SELF-SURVEY MEANS

James S. Shreve, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1981, Ser. No. 258,828
Int. Cl.³ G01S *5/06*
U.S. Cl. 343—449 **15 Claims**



1. A method for a passive station to locate itself relative to a transmitting station transmitting a narrow pulsed scanning beam by utilizing reception of pulses directly from the transmitting station and reception of reflected pulses from a set of scatterers S_i, comprising the steps of:

determining a bearing of said transmitting station from said passive station by rotating a direction finding antenna in azimuth until a first null position is indicated by said direction finding antenna;

measuring a set of differential times t_i, each member of said set of differential times being the difference in time measured between reception of a pulse directly from said transmitting station and reception of said pulse via reflection from a member of said set of scatterers;

determining a set of angles θ_i, said set of angles lying between a line connecting said transmitting station and said passive station and the set of lines connecting said transmitting station with said set of scatterers;

determining a set of angles ψ_i, said set of angles, ψ_i, lying between a line connecting said passive station and said transmitting station and the set of lines connecting said passive station and said set of scatterers; and

calculating a set of ranges r_i, utilizing said sets of differential times t_i, said angles θ_i, and said angles ψ_i, by

calculating a first set of values, ν_i, each member of said first set of values obtained by multiplying the speed of light, the corresponding member of said set of differential times, t_i, and the sine of the sum of the corresponding member of said set of angles, θ_i, and the corresponding member of said set of angles, ψ_i,

calculating a second set of values, χ_i, each member of said second set of values obtained by summing the sine of the corresponding member of said set of angles, θ_i, and the same of the corresponding member of said set of angles, χ_i, and subtracting the sine of the sum of the corresponding members of said sets of angles, θ_i and ψ_i, and

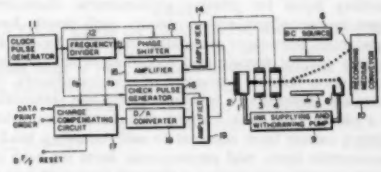
calculating said set of ranges, r_i, by dividing the corresponding members of said first set of values, ν_i, by the corresponding members of said second set of values, χ_i.

4,438,440

PRINT-DISTORTION COMPENSATING DEVICE FOR THE INK JET PRINTING APPARATUS

Koichiro Jinnai, and Yutaka Ebi, both of Kawasaki, Japan, assignors to Ricoh Company, Ltd., Japan

Filed Nov. 27, 1981, Ser. No. 325,302
Claims priority, application Japan, Nov. 26, 1980, 55-167165; Nov. 29, 1980, 55-168182
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. An ink jet printing apparatus for forming images or characters on a recording medium by deflecting ink droplets within a series thereof through any one of a multitude of deflection steps according to basic charging codes comprising:

ink ejection means for ejecting a jet of ink through a nozzle and breaking up said ink jet into ink droplets;

charging electrode means for charging said ink droplets; in response to printing signals;

charging-phase checking electrode means for checking the charging-phase by detecting a charge on said charged ink droplets;

a pair of deflection electrode means for deflecting said charged ink droplets and adapted to be connected to a high voltage direct current source;

a gutter for collecting the unused ink;

an ink supplying and withdrawing pump for supplying ink to said ink ejection means and withdrawing said unused ink collected in said gutter;

a recording medium conveyor for conveying the recording medium on which the charged ink droplets impinge to form the images or characters thereon; and

compensation means for compensating for distortion of the printing position of said ink droplets caused by an influence of neighboring ink droplets, said compensation means including memory means storing signals corresponding to various compensating amounts for each of a predetermined number of neighboring ink droplets, each

of said compensating amounts corresponding to the degree of deflection of the associated ink droplet, and means for reading out said compensating amounts and controlling the addition or non-addition of said compensating amounts to said basic charging codes depending on the presence or absence of ink droplets neighboring an ink droplet to be charged.

4,438,441

MOSAIC RECORDER WITH IMPROVED TRANSDUCER

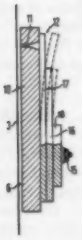
Jan Bolmgren, Vaellingby, and Kenth Nilsson, Akersberga, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,986

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114224

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R 5 Claims



1. In a mosaic recorder having a recording head with a plurality of nozzles disposed in rows for ejecting droplets of recording liquid for printing alphanumeric characters and images in punctiform representation, each nozzle having a piezoelectric transducer associated therewith having a movable free end for forcing said recording liquid through said nozzles upon selected activation of said transducers, the improvement comprising a bilaminar comb-like piezoplate having a plurality of teeth forming said transducers, said plate having a carrier layer adjacent to said recording head and a piezoceramic layer, said piezoceramic layer for each of said transducer teeth terminating a distance from said free end of said transducer such that a fraction of said transducers respectively overlying said nozzles consists solely of exposed carrier layer, said fraction of said transducers being lighter and thinner than a remainder of said piezoplate.

4,438,442

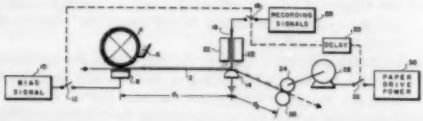
ELECTROGRAPHIC RECORDING APPARATUS WITH DELAYED PAPER DRIVE TERMINATION

Roger D. Erickson, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1981, Ser. No. 310,578

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 6 Claims



1. An electrographic recording apparatus comprising:

a record medium;

motive means for driving said record medium at a predetermine linear speed;

means for depositing toner particles on said record medium as it is drawn past a first position by said motive means;

means for fixing said toner particles onto said record medium as said record medium is drawn past a second position by said motive means, said second position being spaced a fixed distance subsequent to said first position;

means for terminating the deposit of said toner particles on said record medium at a selected time; and

delay means for terminating the operation of said motive means a predetermined time after said selected time.

4,438,443

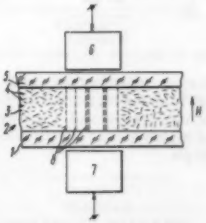
METHOD OF RECORDING INFORMATION ON A MEDIUM IN THE FORM OF ELECTRICAL SIGNALS

Vitaly S. Doev; Iosif M. Kotelyansky, both of Moscow; Valery B. Kravchenko, Fryazino; Yakov A. Monosov; Valery A. Shakhunov, both of Moscow, and Jury L. Kopylov, Fryazino, all of U.S.S.R., assignors to Institut Radiotekhniki I Elektroniki Akademii Nauk SSSR, U.S.S.R.

Filed Oct. 13, 1981, Ser. No. 314,079

Int. Cl.³ G01D *15/06, 15/12*

U.S. Cl. 346—153.1 20 Claims



1. A method of recording of information on a medium in the form of discrete electrical signals, comprising the steps of:

forming a working layer of said medium by substantially uniformly dispersing particles having a dipole moment in a thermoplastic binder, said particles adapted to alter in special orientation in a softened state due to said dipole moment,

applying a substantially uniform thermal field to at least a portion of said layer, to heat said portion above the softening temperature of the binder,

after ceasing application of said thermal field, applying a vector field to said portion of said layer with vector lines of said vector field being oriented substantially perpendicular to the surface of said working layer and said vector field being applied until the individual particles of said portion are substantially aligned along the vector lines, resulting in a change of optical density of said portion of said layer,

at least one of said thermal and vector fields being generated by converting the discrete electrical signals conveying the information to be recorded, and

after ceasing application of said vector field, cooling said portion to a temperature below the softening temperature of said binder, to fix the information being recorded.

4,438,444

MULTI-STYLUS HEAD

Kenya Komada, Yokohama, and Yui-Kuan Tan, Sagamihara, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,261

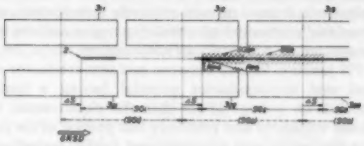
Claims priority, application Japan, Nov. 20, 1979, 54-151271

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—155 4 Claims

1. In an electrographic recording multi-stylus head having a

plurality of styli aligned in at least one row and divided into plural groups, and a plurality of segmented electrodes aligned in at lest one row, each of said groups of styli corresponding to a respective at least two of said segmented electrodes, wherein said groups of styli and said segmented electrodes are adapted to form an electrostatic image on a surface of a dielectric layer of a recording material by applying a voltage between the styli in each of the groups of said styli and the respective at least two segmented electrodes, the improvement comprising:



each group of styli having a leading end stylus and a trailing end stylus arranged in a recording and scanning direction, wherein the leading and trailing end styli of each stylus group are each spaced apart in a same predetermined direction from the centers of the respective at least two segmented electrodes corresponding thereto by a predetermined distance (ΔS) such that each stylus group is offset in said predetermined direction relative to said centers of said respective segmented electrodes by said predetermined distance.

4,438,445

VARIABLE CAPACITANCE DIODE AND METHOD OF MAKING THE SAME

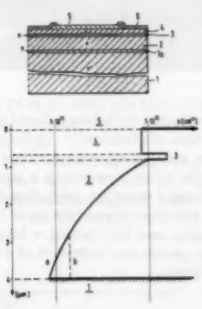
Alexander Colquhoun, Heilbronn-Sontheim, Fed. Rep. of Germany, and Erhard Kohn, Ithaca, N.Y., assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,468

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028820

Int. Cl.³ H01L *29/92, 29/48*

U.S. Cl. 357—14 **17 Claims**



1. A variable capacitance diode comprising a low resistance semiconductor substrate, and epitaxial layer arranged on said semiconductor substrate, and a barrier layer arranged in or on the major surface of said epitaxial layer opposite the major surface adjoining said semiconductor substrate; and wherein said epitaxial layer includes a relatively thin surface region which extends directly beneath the barrier layer and which is less heavily doped than an adjoining very thin intermediate region, and a further region which extends from said intermediate region to said substrate and has an impurity concentration which decreases towards said semiconductor substrate.

4,438,446

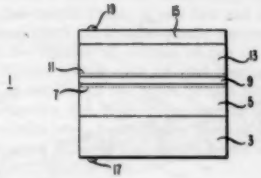
DOUBLE BARRIER DOUBLE HETEROSTRUCTURE LASER

Won-Tien Tsang, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 29, 1981, Ser. No. 268,237

Int. Cl.³ H01S *3/18, 3/19*

U.S. Cl. 357—17 **11 Claims**



1. A light emitting device comprising an active layer having a first bandgap, first and second cladding layers having first and second conductivity types, respectively, and second and third bandgaps, respectively, said active layer being intermediate said first and second cladding layers, a first barrier layer intermediate said first cladding layer and active layer and having a first conductivity type, said first barrier layer having a fourth bandgap, and being directionally graded so that said fourth bandgap increases as the barrier layer-active layer interface is approached; said first bandgap being smaller than said second and third bandgaps and said fourth bandgap being greater than said second and third bandgaps; and electrical contacts to said first and second cladding layers.

4,438,447

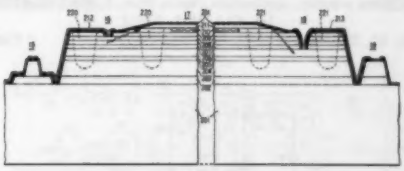
MULTILAYERED OPTICAL INTEGRATED CIRCUIT

John A. Copeland, III, Fair Haven, and Stewart E. Miller, Locust, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 18, 1982, Ser. No. 339,849

Int. Cl.³ H01L *31/12*

U.S. Cl. 357—19 **15 Claims**



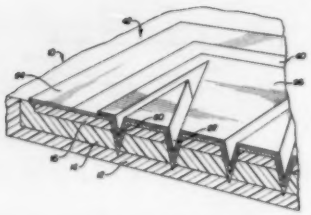
7. An electro-optic integrated device comprising a substrate having a plurality of epitaxial layers grown thereon, at least three of said plurality of epitaxial layers being primary layers, a first primary layer being grown with a bandgap suitable for optical detection, a second primary layer being grown with a wider bandgap suitable for the generation of light that can be detected by said first primary layer, and a third primary layer being grown with a bandgap that is larger than the bandgap of either of said first or second primary layers, at least two regions of said plurality of layers being electrically isolated, a first electrode means for establishing an electrical connection to the first primary layer in one of said two regions, and a second electrode means for establishing an electrical connection to the second primary layer in a second of said at least two regions, said first, second and third primary layers having at least one barrier layer between adjacent primary layers with a bandgap greater than either of said adjacent primary layers.

4,438,448

ZIG-ZAG V-MOS TRANSISTOR STRUCTURE

Alan L. Harrington, Glendale; Richard Allison, Los Angeles, and Vladimir Rodov, North Hollywood, all of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Jul. 18, 1980, Ser. No. 170,131
Int. Cl.³ H01L 21/302, 29/04, 29/78
U.S. Cl. 357—23 24 Claims



1. In a V-MOS transistor having source, body and substrate regions, a V-groove configuration comprising:

a first set of parallel V-grooves disposed through the source and body regions and into the substrate region; and

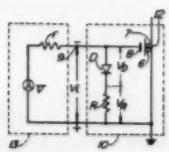
a second set of parallel V-grooves which are disposed at an intersecting angle with respect to said first set of V-grooves, and are also disposed through said source and body regions and into said substrate region, and are interleaved among said first set of grooves such that one end of each V-groove in said second set is in contact with one end of an adjacent V-groove in said first set and the other end of each said V-groove in said second set is in contact with one end of the other adjacent V-groove in said first set.

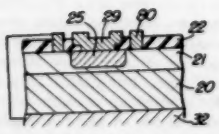
4,438,449

FIELD EFFECT SEMICONDUCTOR DEVICE HAVING A PROTECTIVE DIODE WITH REDUCED INTERNAL RESISTANCE

Koji Usuda, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1980, Ser. No. 151,985
Claims priority, application Japan, Mar. 3, 1967, 42-13079
Int. Cl.³ H01L 27/02
U.S. Cl. 357—41 2 Claims





1. A semiconductor device comprising:

a semiconductor material of a first conductivity type including a relatively high resistivity region extending to a major surface of said semiconductor material, and a relatively low resistivity region;

a semiconductor region of a second conductivity type opposite to the first conductivity type contacting the semiconductor material at said major surface thereof and closely spaced from said relatively low resistivity region;

an insulating film including a relatively thick portion and a relatively thin portion, the relatively thin portion being formed so as to cover the major surface of said relatively high resistivity region and being susceptible to electrostatic breakdown; and

an electrode formed on said relatively thin portion, spaced from said relatively high resistivity region and electrically connected to said semiconductor region;

the PN junction formed between said semiconductor region and said semiconductor material having a backward breakdown voltage lower than the electro-static breakdown voltage of said relatively thin portion of the insulating film below said electrode; and further including

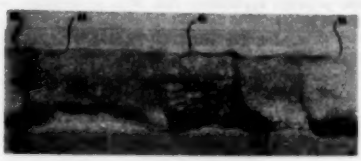
a first additional electrode contacting said region of low resistivity at a surface of said semiconductor material opposite said major surface, and including a second additional electrode disposed on said semiconductor material and contacting said semiconductor region of high resistivity while being connected to said first additional electrode.

4,438,450

SOLID STATE DEVICE WITH CONDUCTORS HAVING CHAIN-SHAPED GRAIN STRUCTURE

Tan T. Sheng, Berkeley Heights; Ashok K. Sinha, and Sheila Vaidya, both of New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 98,979, Nov. 30, 1979, abandoned. This application Dec. 7, 1981, Ser. No. 328,149
Int. Cl.³ H01L 23/48, 29/44, 29/46, 29/62
U.S. Cl. 357—68 6 Claims



1. A solid state device including a first layer having a first surface and a pattern of electrically conducting lines thereon, each of said lines comprising a single layer of like material, each of said single layers comprising a succession of grains forming a chain-shaped structure, each of said grains extending from side to side and from top to bottom of the respective one of said single layers, said line having a length much greater than said width to permit the formation of a significantly long chain of grains therein.

4,438,451

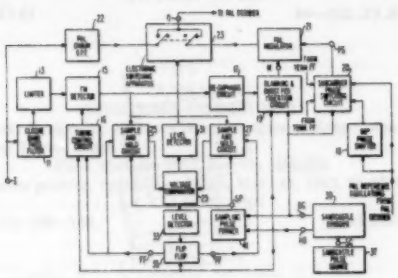
DUAL-STANDARD SECAM/PAL COLOR TV RECEIVER WITH AUTOMATIC CONTROL OF OPERATING MODE

Werner Hina, Zollikerberg, Switzerland, and Mark B. Knight, Somerville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,211
Claims priority, application United Kingdom, Apr. 29, 1981, 8113294
Int. Cl.³ H04N 9/50, 9/42
U.S. Cl. 358—11 8 Claims

1. In a dual-standard color television receiver having multiple operating modes and subject to alternative reception of (a)

composite color television signals inclusive of a chrominance component encoded in a SECAM format and (b) composite color television signals inclusive of a chrominance component encoded in a PAL format; said SECAM-encoded chrominance component being accompanied by lead-in oscillations of a first subcarrier frequency during a terminal segment of the blanking portion of alternate active line intervals, and lead-in oscillations of a second subcarrier frequency during a similarly timed terminal segment of the blanking portion of the intervening active line intervals; said PAL-encoded chrominance component being accompanied by bursts of reference oscillations of a third subcarrier frequency, said bursts occupying a period of the blanking portion of each active line interval which corresponds in timing to an initial part of each of said terminal segments; apparatus comprising:



an FM detector responsive to the received signals;

means for generating line rate pulses having leading edges delayed relative to the beginning of said initial part of said terminal segments and trailing edges substantially coinciding with the termination of said terminal segments;

means, responsive to an output of said FM detector and to said line rate pulses, for developing a control signal indicative of the relationship between the amplitudes of (a) the output developed by said FM detector during alternate appearances of said line-rate pulses and (b) the output developed by said FM detector during the intervening appearances of said line rate pulses;

means, responsive to said control signal, for controlling the operating mode of said dual-standard color television receiver.

4,438,452

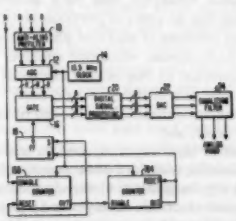
TRANSCODER FOR SAMPLED TELEVISION SIGNALS

Kerns H. Powers, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 262,619, May 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 230,384, Feb. 2, 1981, abandoned. This application Aug. 26, 1982, Ser. No. 411,907

Int. Cl.³ H04N *9/493*

U.S. Cl. 358—13 **7 Claims**



2. A transcoder for transcoding a first television signal sampled at a first frequency (F1) into a second sampled signal by approximation of the values of those samples of said first signal which must be interpolated to form said second signal, comprising:

a clock signal generator coupled to the source of said first signal for generating a second signal sampling clock signal at a second frequency selected such that the ratio of said first and second frequencies is substantially equal to the quotient of integers, whereby said sample points recur in blocks in which the first samples of said first and second signals within a block occur substantially simultaneously and the last sample points of said first and second signals within each block occur substantially simultaneously, and wherein the number of samples of one of said first and second signals within each of said blocks exceeds the number of samples of the other of said first and second signals whereby the times of occurrence of said second signal samples move between the times of occurrence of the samples of adjacent first sample points over the duration of one of said blocks;

delay means coupled to receive said first signal for delaying said first signals to form at least second and third delayed signals delayed from said first,

differencing means coupled to said delay means for forming difference signals representing the difference in amplitude between successive delayed signals;

multiplying means coupled to said differencing means for receiving said difference signals and for multiplying said difference signals by a running variable to form weighted difference signals;

running variable generating means coupled to said multiplying means and to said clock signal generating means for generating said running variable indicative of the time position of each new sample between successive samples of said first signal; and

summing means coupled to said multiplying means for summing together said weighted difference signals.

4,438,453

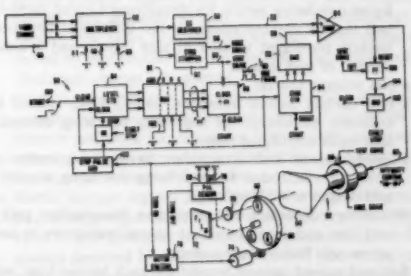
CONSTANT LIGHT GREYSCALE GENERATOR FOR CRT COLOR CAMERA SYSTEM

Lawrence E. Alston, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 21, 1982, Ser. No. 341,317

Int. Cl.³ H04N *1/46, 5/84*

U.S. Cl. 358—78 **24 Claims**



17. A method of obtaining a hard copy of a video frame represented by periodic video signals which lie within a predetermined range of amplitudes that define N levels of brightness comprising the steps of:

comparing the amplitude of the video signals with a reference signal level to provide a select output signal when the amplitude of the video signals is at least equal to the amplitude of said reference signal;

shifting the reference signal level through N levels corresponding to the N levels of brightness defined by the

predetermined range of video signal amplitudes at a frequency functionally related to and synchronized with the periodic frequency of the video signals;

controlling the intensity of a display screen to provide a two-level brightness distribution with the upper of said two levels of brightness occuring in response to said select output signal from said comparator; and

exposing a sheet of photosensitive material to said display screen.

4,438,454

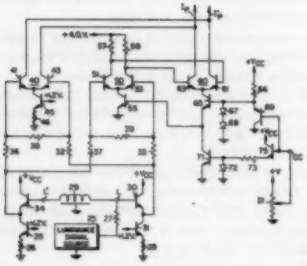
ADJUSTABLE CORING CIRCUIT PERMITTING CORING EXTINCTION

Robert L. Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 363,856, Mar. 31, 1982. This application Jan. 25, 1983, Ser. No. 460,846

Int. Cl.³ H04N 9/535

U.S. Cl. 358—31 **6 Claims**



1. A system for effecting an adjustable amount of coring of signals derived from a source comprising:

first signal translating means, having an input coupled to said source, for linearly translating said signals;

second signal translating means, having an input coupled to said source, for non-linearly translating said signals; said second signal translating means comprising a multistage limiting amplifier for developing a limited version of said signals, said limiting amplifier including respective input and output amplifying stages coupled in cascade;

means, responsive to the outputs of said first and second signal translating means, for developing a cored version of said signals corresponding to the difference between a linearly translated version of said signals and a limited version of said signals;

a bias voltage source;

a first current source transistor, having base, emitter and collector electrodes, for supplying operating current to said input amplifying stage;

a second current source transistor, having base, emitter and collector electrodes, for supplying operating current to said output amplifying stage;

means for connecting the respective base-emitter path of said first and second current source transistors in series across said bias voltage source;

first and second control transistors, each having base, emitter and collector electrodes, said first and second control transistors being of mutually opposite conductivity types;

means for connecting the collector-emitter path of said first control transistor in shunt with the base-emitter path of said first current source transistor;

means for connecting the emitter-collector path of said second control transistor in shunt with the series combination of the base-emitter paths of said first and second current source transistors;

a source of variable DC voltage; and

means for rendering the base electrodes of both of said first and second control transistors responsive to said variable DC voltage.

6. Apparatus in accordance with claim 1, for use with a source of luminance signals in a television receiver, wherein the signals subject to coring comprise horizontal peaking signals derived from said luminance signal source.

4,438,455

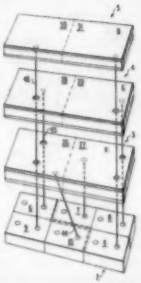
SOLID-STATE COLOR IMAGER WITH THREE LAYER FOUR STORY STRUCTURE

Masatoshi Tabei, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 330,928, Dec. 15, 1981, abandoned. This application Jul. 8, 1983, Ser. No. 512,052

Int. Cl.³ H04N 9/07

U.S. Cl. 358—44 **13 Claims**



1. A solid-state color imager, comprising:

a solid-state base comprised of an array of electrical switching elements arranged on portions of said base in sets of three;

a first layer of insulation material positioned over said base;

a first photosensitive layer superimposed on said first layer of insulation material, said photosensitive layer being comprised of a top transparent electrode sublayer, a back mosaic electrode sublayer, and a photoconductive sublayer positioned between said top and back sublayers, said back mosaic electrode sublayer being segmented into an array of portions corresponding to said electrical switching elements on said base, and each segmented portion of said back mosaic electrode sublayer being electrically connected with one of said electrical switching elements from said sets of three elements on said base;

a second layer of insulation material positioned over said first photosensitive layer;

a second photosensitive sublayer superimposed over said second layer of insulation material, said second photosensitive sublayer being comprised of a top transparent electrode sublayer, a back transparent mosaic electrode sublayer, and a photoconductive sublayer positioned between said top and back sublayers, said back mosaic sublayer being segmented into an array of portions vertically corresponding to said portions of said first photosensitive layer, wherein each back mosaic electrode sublayer portion is electrically connected to one of said electrical switching elements from said sets of three on said base;

a third layer of insulation material positioned on said second photosensitive layer; and

a third photosensitive layer superimposed on said third layer of insulation material, said third photosensitive layer being comprised of a top transparent electrode sublayer, a back transparent mosaic electrode sublayer and a photoconductive sublayer positioned between said top and back sublayers, said back mosaic sublayers being segmented into an array of portions vertically corresponding to said portions in said second photosensitive layer, wherein said back

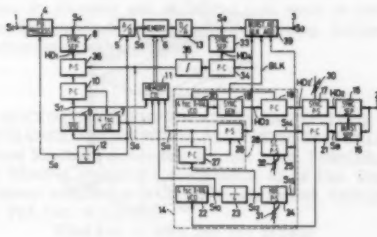
mosaic sublayer portions are electrically connected to one of said electrical switching elements from said sets of three on said base, said first, second and third photosensitive layers being sensitive to and absorptive of different ranges of the visible wavelength spectrum, whereby electrical signals from said photosensitive layers represent light intensities of three different color ranges.

4,438,456

TIME BASE CORRECTOR

Tadaaki Yoshinaka, Hadano, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 360,904
Claims priority, application Japan, Mar. 28, 1981, 56-45754
Int. Cl.³ H04N 5/06
U.S. Cl. 358—148 **13 Claims**



1. A time base corrector for removing time base errors from composite color video signals comprising:

input circuit means for receiving incoming composite color video signals which include horizontal sync signals;

horizontal sync separating means connected with said input circuit means for separating said horizontal sync signals from said incoming composite color video signals;

write clock and write start pulse generating means for generating write clock and write start pulses in synchronism with said horizontal sync signals separated from the incoming composite color video signals;

read clock and read start pulse generating means having an input for receiving reference video signals and being operative to generate read clock and read start pulses on the basis of said reference video signals;

memory means into which said incoming color video signals are written for temporary storage in response to said write clock and write start pulses and from which the temporarily stored color video signals are read in response to said read clock and read start pulses;

means connected with said read clock and read start pulse generating means for providing added sync and sub-carrier signals and inserting said added sync and sub-carrier signals in said color video signals read from the memory means; and

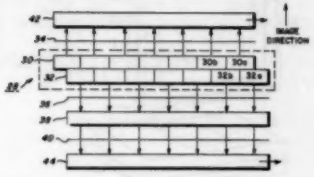
phase control means for varying a phase of said separated horizontal sync signals with which said write clock and write start pulses are synchronized in accordance with a change in the relative phase of said read start pulses and said added sync signals.

4,438,457

HIGH RESOLUTION IMAGER EMPLOYING STAGGERED SENSOR STRUCTURE

Jagdish C. Tandon, Fairport, N.Y.; Narayan K. Kadekodi, Torrance, Calif.; Abd-El-Fattah A. Ibrahim, Palos Verdes Estates, Calif.; Roland J. Handy, Northridge, Calif., and James C. Stoffel, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 284,742
Int. Cl.³ H04N 3/14
U.S. Cl. 358—213 **4 Claims**



1. A high density charge coupled device imaging array (58) on a single integrated circuit chip comprising a first row (60) of photosites deposited on said integrated circuit chip, said photosites being sensitive to applied light information, a second row (62) of photosites deposited on said integrated circuit chip immediately adjacent to and contiguous with said first row of photosites, said second row of photosites being offset from said first row of photosites approximately one-half the length of the individual photosites on said first row such that said second row of photosites are sensitive to applied light information intermediate the photosites in said first row of photosites, said first and second rows of photosites comprising a bilinear array of photosites, a first storage register (72) deposited on said integrated circuit chip adjacent to said first row (60) of photosites to receive and store the bits of light information detected by said first row of photosites (60) and converted to electronic charge information, wherein the improvement is characterized by:

a second storage register (68) deposited on said integrated circuit chip adjacent to said row (62) of photosites to receive and store alternate bits of light information detected by said second row of photosites and converted to electronic charge information,

a third storage register (70) deposited on said integrated circuit chip adjacent to said second storage register (68) to receive and store the remaining bits of light information detected by said second row of photosites and converted to electronic charge information,

a fourth storage register (74) deposited on said integrated circuit chip adjacent to said first storage register (72) to receive and store alternate intermediate bits of light information detected by said first row (60) of photosites, converted to electronic charge information and received by said first storage register (72).

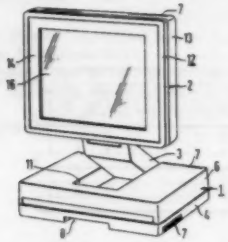
a fifth storage register (76) deposited on said integrated circuit chip adjacent to said fourth storage register (74) to receive and store the remaining bits of light information detected by said first row (60) of photosites converted to electronic charge information and received by said first storage register (72), and

wherein said second (68), third (70), fourth (74), and fifth (76) storage registers comprise a quadrilinear array such that all four registers contain the detected light information from one line of scan at the same time.

4,438,458
DATA DISPLAY DEVICE

Wolfgang Münscher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,958
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105601
Int. Cl.³ H04N *5/64, 5/655*
U.S. Cl. 358—254 **6 Claims**



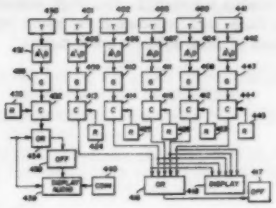
1. Data display device, comprising a plate-shaped flat pedestal part having a rectangular base with four sides, front, rear and lateral edges, and an upper surface having a recess formed therein parallel to said lateral edges, a plate-shaped screen part being disposed on top of said pedestal part and having a given surface area facing away from said pedestal part, a lower surface, front and rear edges and narrow sides, a display field substantially taking up said given surface area, an extended swivel arm support having one end being pivotable along an axis in vicinity of said upper rear edge of said pedestal part and another end being pivotable along the axis in vicinity of said lower rear edge of said screen part for supporting said screen part on said pedestal part, said axes being parallel to said upper rear edge of said pedestal part, said swivel arm being movable into a position in said recess flush with said upper surface of said pedestal part, said screen part being pivotable into a perpendicular position with respect to said pedestal part with said swivel arm in said flush position displaying a continuous planar frontal surface, and said screen part being pivotable into a parallel position with respect to said pedestal part with said swivel arm in said flush position and said screen part resting on said pedestal part with said narrow sides of said screen part at least substantially in alignment with two of said sides of said pedestal part.

4,438,459
MULTIPLEX PHOTOCOPIER SYSTEM WITH PORTABLE SCANNER

Alfred B. Levine, P.O. Box 9516, Washington, D.C. 20016

Division of Ser. No. 84,851, Dec. 4, 1979, and Ser. No. 925,290, Jul. 17, 1978, Pat. No. 4,251,153, said Ser. No. 925,290, is a continuation-in-part of Ser. No. 718,260, Aug. 27, 1976, Pat. No. 4,182,569, and Ser. No. 775,480, Mar. 8, 1977, abandoned. This application May 17, 1982, Ser. No. 378,577
Int. Cl.³ H04N *1/20*
U.S. Cl. 358—258 **10 Claims**

1. A copier system having plural independantly operable optical reader stations and a fewer number of developer mechanisms for producing hard copy reproductions of visual images read by said optical reader stations, malfunction indication and control means, said malfunction indication and control means including monitoring means for those operating components of the system that affect only individual reader stations for detecting malfunction of those components, and control and indicator means for each station for deenergizing only the affected stations in response to unacceptable malfunction thereof and indicating the source of malfunction of the affected stations, and additional monitoring means for those operating components of the system that affect all stations, and additional control and indicator means for deenergizing the entire copier

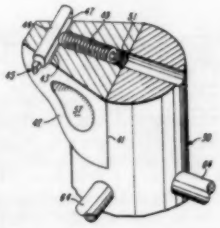


system in response to unacceptable malfunction thereof and indicating the source of malfunction.

4,438,460
ENGRAVING APPARATUS AND METHOD

Lester W. Buechler, 3193 Plainfield Rd., Dayton, Ohio 45432

Filed Sep. 24, 1982, Ser. No. 422,651
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—299 **6 Claims**



1. Apparatus for engraving cells in the surface of a gravure printing cylinder, comprising an engraving head, means supporting said head for relative movement adjacent the surface, said head including a shaft and an engraving stylus, means on said shaft and supporting said stylus eccentrically of the axis of said shaft, said stylus supporting means including an arm having a transverse hole extending generally tangent to the arc of oscillation of said arm, a stylus support holder extending within said hole, means extending generally radially outwardly within said arm and releasably securing said holder to said arm, spring means rigidly secured to said head and supporting said shaft and said stylus for oscillation, and power operated drive means for oscillating said shaft and said stylus.

4,438,461
INTEGRATED INPUT/OUTPUT SCANNER FOR ELECTRONIC DOCUMENT PROCESSING

William D. Turner, San Marino, and Robert A. Sprague, Saratoga, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 5, 1981, Ser. No. 308,301
Int. Cl.³ H04N *1/22*
U.S. Cl. 358—302 **12 Claims**

1. An integrated input/output scanner for generting a first group of data samples to represent the information content of a subject copy and for exposing a photosensitive recording medium in accordance with a second group of data samples representing picture elements of an image; said scanner comprising

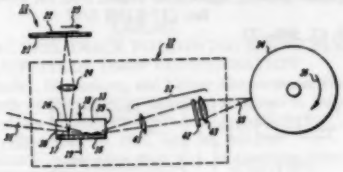
an optically transparent electro-optic element;

an array of photodetectors;

an array of individually addressable electrodes distributed in spaced apart relationship laterally of said electro-optic element adjacent a longitudinal surface thereof;

a substrate for supporting said photodetector array and said electrode array;

means for transmitting a light beam in a generally longitudinal direction through said electro-optic element, said light beam being collimated laterally of said electro-optic element;



means for imaging said subject copy onto said photodetector array without any appreciable mixing with said light beam, whereby said photodetectors generate said first group of data samples;

means for supplying said second group of data samples;

means for applying said second group of data samples to said electrodes for spatially modulating said light beam in accordance with said picture elements; and

means for focusing said modulated light beam on said recording medium to expose said recording medium in accordance with said image.

4,438,462

DOCUMENT IDENTIFICATION EMPLOYING EXCHANGE-ANISOTROPIC MAGNETIC MATERIAL

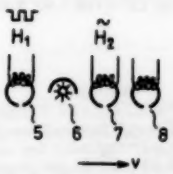
Eberhard Koester, Frankenthal; Joachim Hack, Ludwigshafen, and Manfred Steuerwald, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,629

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950129

Int. Cl.³ G11B *25/04*

U.S. Cl. 360—2 **4 Claims**



1. A process for authenticating recording media which are to be safeguarded against falsification and which possess a layer of exchange-anisotropic magnetic material whose Neel temperature T_N is lower than the Curie temperature T_c of the ferromagnetic or ferrimagnetic component, wherein this layer of the recording medium is successively

(a) recorded with a sequence of signals,

(b) heated to a temperature T_2 which is below T_c and above T_{AFS},

(c) cooled to a temperature T_1 which is below T_2, and

(d) exposed to a magnetic AC field which decreases to zero and whose strength is at least four times as great as the coercive force of the magnetic material present, and subsequently

(e) the residual magnetic recording is determined and compared with the sequence of signals recorded under (a).

4,438,463

TRACKING CONTROL SYSTEM

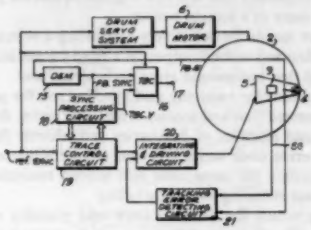
Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,199

Claims priority, application Japan, Aug. 6, 1980, 55-107938

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—10.2 **15 Claims**



1. An apparatus for reproducing information signals recorded in successive parallel tracks extending obliquely on a record tape, which apparatus includes transducer means repeatedly scanning across the tape generally in a direction along the tracks for reproducing the signals recorded therein while the tape is advanced longitudinally at a selected reproducing speed which is any arbitrary ratio n of a normal reproducing speed, and transducer deflecting means responsive to a drive voltge for deflecting said transducer means in a direction transverse to said direction along the tracks; a tracking control system comprising means for determining the value of said ratio n; means for extracting, from said value of the ratio n, the values m and l of an integer and a fraction, respectively, which, when added to each other, provide a sum equal to said ratio n; means for forming relatively large and small head jump voltages which respectively correspond to said value m and a value (m − 1); means for providing a reproduced phase of the output of said transducer means in correspondence to a specific position along a track; means for forming a reference phase on the basis of said value l; discriminating means for determining whether said reference phase is in leading or lagging relation to said reproduced phase; means responsive to said discriminating means for selecting one of said large and small head jump voltages; and means operative at the end of each said scanning for including the then selected one of said large and small head jump voltages in said drive voltage applied to said transducer deflecting means for determining the next one of said tracks to be scanned.

4,438,464

METHOD FOR EDITING OF PCM SIGNAL AND APPARATUS THEREOF

Kentaro Odaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 324,139

Claims priority, application Japan, Jan. 25, 1980, 55/165571

Int. Cl.³ G11B *27/02, 5/00*

U.S. Cl. 360—13 **10 Claims**

1. Apparatus for editing PCM signals by reproducing a plurality of first data sections from a first recording medium and recording a plurality of second data sections on a second recording medium, each of said first and second data sections including a respective plurality of data series and respective first and second error code series, said apparatus comprising:

reproducing means for reproducing one of said first data sections from said first recording medium;

first decoder means for receiving said reproduced first data section and for producing a respective plurality of data series and first and second error code series ordered in a first alignment as a first output;

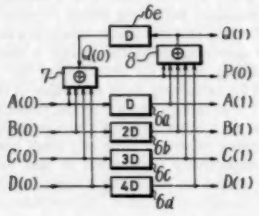
recording/reproducing means for recording on and reproducing from said second recording medium a second data section composed of a respective plurality of data series and first and second error code series ordered in a second alignment;

second decoder means for receiving said reproduced second data section, for reordering its respective plurality of data series and first and second error code series from said second alignment into said first alignment, and for producing the same as a second output;

multiplexer means for selectively outputting a selected one of said first and second outputs as a third output including received first and second error code series; and

encoding means for receiving said third output, for generating generated first and second error code series, for reordering said plurality of data series and selected first and second error code series into said second alignment and for recording the same onto said second recording medium, said encoding means including

first delay means for delaying once said plurality of data series and said received first error code series by a first predetermined period from said received second error code series;



second delay means for delaying twice said once delayed plurality of data series with respect to each other by a plurality of second different predetermined periods;

first error code generation means for generating a first generated error code series in response to said once delayed plurality of data series;

first selection means for selecting a selected one of said once delayed received first error code series and said generated first error code series in response to a selection of said first and second outputs;

second error code generation means for generating a second generated error code series in response to said twice delayed plurality of data series and said selected one of said once delayed received first error code series and said generated first error code series;

second selection means for selecting a selected one of said received second error code series and said generated second error code series in response to a selection of said first and second outputs; and

third delay means for delaying said selected one of said received second error code series and said generated second error code series by said first predetermined period.

4,438,465

TRACKING CONTROL SYSTEM FOR AN INFORMATION SIGNAL RECORDING AND REPRODUCING APPARATUS

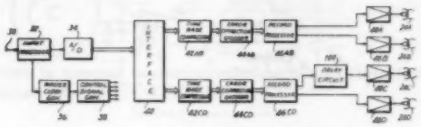
Ryusuke Moriya, Hadano; Takeo Eguchi, Hadani, and Takeo Ohba, Sagamihara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 261,455, May 7, 1981. This application Dec. 14, 1981, Ser. No. 330,255

Claims priority, application Japan, Dec. 13, 1980, 55-176411

Int. Cl.³ G11B 5/02

U.S. Cl. 360—22 **10 Claims**



1. Apparatus for simultaneously recording information signals in at least four successive, parallel channel tracks on a record medium, comprising:

processing means for processing said information signals and for distributing said information signals into at least four channels;

at least four transducer means corresponding to said at least four channels for recording said information signals from said at least four channels in said at least four channel tracks on said record medium, with first and second adjacent ones of said at least four channel tracks having the information signals recorded therein with different azimuth angles; and

delay means for delaying the information signals recorded in one of said first and second channel tracks relative to the information signals recorded in the other of said first and second channel tracks.

4,438,466

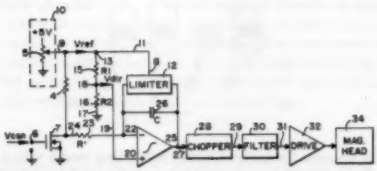
D.C. CONTROLLED ADJUSTABLE RAMP SIGNAL GENERATOR AND METHOD

John S. Fawkes, and Walter F. Umholtz, both of San Jose, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,735

Int. Cl.³ G11B 5/47, 5/02

U.S. Cl. 360—66 **17 Claims**



1. A circuit for generating a D.C. controlled adjustable ramp signal, comprising:

an adjustable D.C. reference voltage source having an output coupled to provide a desired adjustable D.C. reference voltage;

a first means having an input coupled to receive said adjustable D.C. reference voltage and having an output coupled to provide a predetermined ratio thereof;

an integrating means having an inverting input coupled to receive a positive or negative D.C. input step voltage for responsively coupling said inverting input to said adjustable D.C. reference voltage or ground, respectively, having a non-inverting input coupled to said output of said first means for receiving said predetermined ratio of said

adjustable D.C. reference voltage and having an output coupled to provide said ramp signal in response to said D.C. input step voltage; and

said integrating means being further coupled to receive said adjustable D.C. reference voltage and to limit a maximum value of said ramp signal provided thereby to a value determined by said adjustable D.C. reference voltage.

4,438,467

MAGNETIC DISK TRACK FOLLOWING SERVO BURST AMPLITUDE DROP COMPENSATION

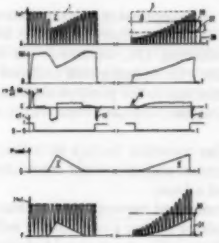
Karl H. Schaller, Herrenberg, and Volker Zimmermann, Sindelfingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,939

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120327

Int. Cl.³ G11B *5/58, 21/10*

U.S. Cl. 360—77 **5 Claims**



1. A method of compensating for decreases in the amplitude of servo signals read from a magnetic record for the track following control of a magnetic head, said servo signals appearing in periodic bursts, comprising the steps of

detecting the amount of said signal amplitude decrease in each said burst,

generating a complementary oppositely directed correction signal, and

adding said complementary correction signal to said servo signal prior to use of said servo signal for track following control.

4,438,468

TAPE CASSETTE TRANSFERRING MACHINE

Hideaki Kamei, Kyoto; Kazuhiko Yamanaka, Yawata; Haruhiko Fujisawa, Kyoto, and Shinichiro Oda, Osaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 19, 1981, Ser. No. 266,389

Claims priority, application Japan, May 20, 1980, 55-69637[U]; May 20, 1980, 55-69638[U]; May 20, 1980, 55-69639[U]; May 20, 1980, 55-69640[U]

Int. Cl.³ G11B *15/68*

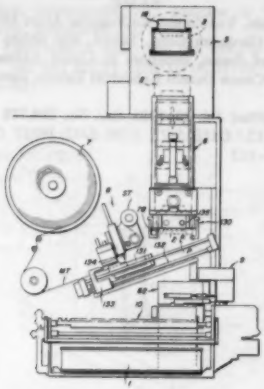
U.S. Cl. 360—92 **9 Claims**

1. A recording tape cassette machine for transferring tape cassettes towards a tape cassette treating machine which treats tape cassettes sequentially which comprises:

means for receiving at least one movable magazine container having a chamber for accommodating a plurality of recording tape cassettes, each of which stands parallel in a side-by-side relationship with a vertical attitude, aligned in the same direction;

means for discharging said tape cassettes from said magazine simultaneously; and

a cassette transferring means which receives each of said tape cassettes from said magazine with the attitute thereof aligned in the same direction and which forwards the



respective tape cassettes sequentially towards said tape cassette treating means maintaining said aligned condition.

4,438,469

DEFLECTABLE TRANSDUCER MOUNTING ASSEMBLY

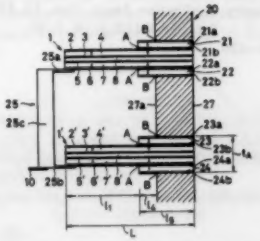
Takeo Ohba, Sagamihara, and Hirohisa Koga, Zama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,786

Claims priority, application Japan, Sep. 30, 1980, 55-136014

Int. Cl.³ G11B *21/18*

U.S. Cl. 360—109 **15 Claims**



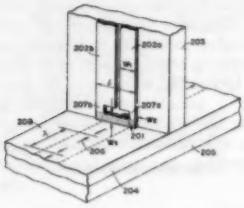
1. A deflectable transducer mounting assembly for mounting a transducer on a member, comprising first deflectable means having a first end to be coupled to said member so as to be cantilevered therefrom and a free end on which said transducer is mounted, said first deflectable means being deflectable in response to drive signals supplied thereto; and a pair of second deflectable means being deflectable in response to drive signals supplied thereto, said pair of second deflectable means being disposed at said first end of said first deflectable means to sandwich said first end therebetween and, when assembled with said member, said pair of second deflectable means is secured to said member.

4,438,470

MAGNETIC HEAD OF MAGNETIC RELUCTANCE EFFECT TYPE AND A METHOD FOR MAKING THE SAME

Takeshi Sawada, Yokohama; Ko Yoneda; Akira Shinmi, both of Kawasaki; Hirokazu Goto, Tokyo, and Shuzo Abiko, Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Jul. 20, 1981, Ser. No. 284,708
Int. Cl.³ G11B 5/12, 5/30, 5/42; H01F 7/06
U.S. Cl. 360—113 3 Claims



1. A magnetic reluctance effect type magnetic head comprising:

support means made of nonmagnetic material; and

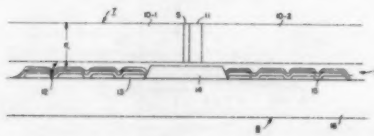
magnetic sensor means formed on said support means of magnetic reluctance effect material that varies in electric resistance in respone to a magnetic field, said magnetic sensor means being formed in a generally U-shape, having legs and a base contact, said legs of which define a pair of lead sections each having a width of W_1 at the top portion thereof and said base contact of which defines a plurality to triangular wave-like sections, connecting the bottom portions of said legs in series, each having a width of W_2; the width W_1 being greater than the width W_2.

4,438,471

MAGNETIC HEAD FOR PERPENDICULAR MAGNETIC RECORDING SYSTEM

Mitsumasa Oshiki, Yokohama, and Susumu Kawakami, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 5, 1980, Ser. No. 213,406
Claims priority, application Japan, Dec. 13, 1979, 54-162324
Int. Cl.³ G11B 5/14, 5/20
U.S. Cl. 360—125 16 Claims



1. A perpendicular recording magnetic head comprising:

(a) a pole substrate member having a first surface forming a transducer face and a second surface opposite thereto, the pole substrate member being formed of first and second non-magnetic substrate portions with corresponding side edges for bonding, and a main pole of a thin ferromagnetic film formed on the side edge of said first substrate portion with the corresponding side edge of the second substrate portion bonded thereto; and

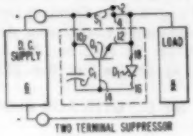
(b) a coil substrate member having a coil substrate with a magnetic portion in contact with the main pole thin film and a flat coil formed on the surface of said coil substrate, the pole substrate member being bonded at the second surface thereof to said coil substrate member wherein the main pole thin film in the pole substrate is positioned vertically to the center of the flat coil on the coil substrate to form a single integrated perpendicular recording magnetic head.

4,438,472

ACTIVE ARC SUPPRESSION FOR SWITCHING OF DIRECT CURRENT CIRCUITS

George K. Woodworth, Manassas, Va., assignor to IBM Corporation, Armonk, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,744
Int. Cl.³ H02H 7/22
U.S. Cl. 361—13 6 Claims



1. An active arc suppression circuit connected in parallel with a first and second contacts of a relay switch to be protected while switching DC currents, said switch having a characteristic delay for opening said contacts and having said first contact connected to the positive terminal of a DC power supply and said second contact connected to a load, comprising:

an NPN bipolar transistor having its collector connected to said first contact and its emitter connected to said second contact, and a base;

a capacitor connected between said collector and said base of said transistor having a capacitance sufficiently large to require an interval longer than said characteristic delay to charge up, for passing load current from said first contact to said base when said contacts are opened, turning on said transistor to shunt said load current around said contacts until said capacitor charges up after said characteristic delay, at which time said transistor turns off;

a diode having its cathode connected to said base and its anode connected to said emitter of said transistor, for quickly discharging said capacitor when said contacts are closed;

whereby arcs which may occur across said contacts upon opening are suppressed.

4,438,473

POWER SUPPLY FOR AN INTRINSICALLY SAFE CIRCUIT

James C. Cawley, Venetia; Michael D. DiMartino, Library; Thomas J. Fisher, Munhall; Roger L. King, and Marcus H. Uhler, both of Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 21, 1981, Ser. No. 285,247
Int. Cl.³ H02H 3/08
U.S. Cl. 361—18 4 Claims

1. A binary controlled current interrupter circuit to safely control the supply of power to a remote electrically operated load located in an explosive atmosphere comprising:

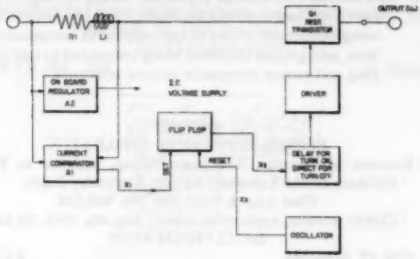
input and output terminals for the interrupter, said output terminals being electrically connected to the load in the explosive atmosphere;

means to sense the current level rate of change between the interrupter's input and output terminals to output a signal should the detected current rate of change exceed a predetermined level;

means to sense the voltage level drop across a sampling section between the input and output terminals of the interrupter to output a signal should this level exceed a predetermined voltage level;

flip-flop switch means actuated by the output signal from either the current level rate of change means or the voltage sensing means to output a responsive signal;

delay means actuated by a signal from the flip-flop switch means for delaying the turn on of the load initially or after any subsequent interruptions of power thereto, said delay means providing for the turn off of power to the load several times more rapidly than its turn on of power; and



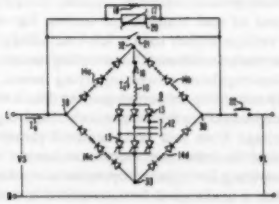
a pass transistor switch means to control the signal output of the interrupter and response to the output signal from the flip-flop and delay means to cease the supply of electrical energy to the load should either the predetermined sensed circuit rate of change means or the voltage levels be reached.

4,438,474

CURRENT LIMITER AND VAR GENERATOR UTILIZING A SUPERCONDUCTING COIL

Derek A. Paice, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1982, Ser. No. 377,524
Int. Cl.³ H02H *9/02*
U.S. Cl. 361—58 **21 Claims**



1. A current limiting device, comprising:

a plurality of unidirectional voltage means interconnected so as to have an input connected to an electrical power source for producing a constant polarity voltage at output terminals thereat;

current generating means for producing a current in a superconducting impedance means; and

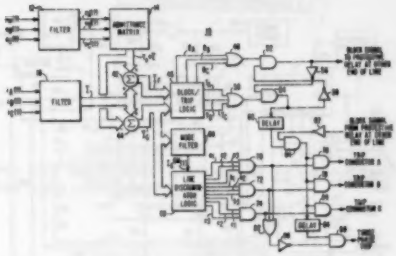
superconducting impedance means connected in series circuit relationship with said current generating means, said series circuit being connected to said output terminals, thereby slowing down the rate of current rise produced by said electrical power source.

4,438,475

ULTRA-HIGH SPEED PROTECTIVE RELAY APPARATUS AND METHOD FOR PROVIDING SINGLE POLE SWITCHING

Paul H. Haley, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 2, 1982, Ser. No. 404,170
Int. Cl.³ H02H *3/26*; G01R *31/08*
U.S. Cl. 361—82 **48 Claims**



1. A protective relay for determining the location of a fault on the conductors of a three-phase ac electrical transmission line, comprising:

means for providing first, second, and third incident-wave signals representative of the current produced on each conductor by a fault-launched incident traveling wave arriving at the relaying point from a first direction;

means for providing first, second, and third forward-wave signals representative of the current produced on each conductor by a fault-launched forward traveling wave arriving at the relaying point from a second direction;

comparator means for comparing said first, second, and third incident-wave signals with, respectively, said first, second, and third forward-wave signals to provide an indication of the direction to the fault and to provide an enable signal when the fault is in said first direction;

first filter means for filtering said first, second, and third incident-wave signals to provide a modal signal representing the total current produced on the transmission line by a first propagational mode of said first incident traveling wave; and

discriminator means for processing said first, second, and third incident-wave signals, said modal signal, and said enable signal to provide an indication of the location of the fault.

4,438,476

SELECTABLE INTEGRATING CHARACTERISTIC TIMER FOR PROTECTIVE RELAYS

Thomas B. Breen, Lansdowne, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed May 17, 1982, Ser. No. 378,589
Int. Cl.³ H02H *3/093*
U.S. Cl. 361—96 **10 Claims**

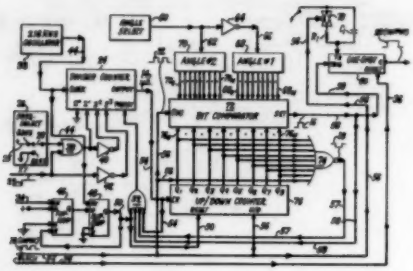
1. A selectable characteristic timer which measures the time duration of an applied signal representative of the normal or abnormal conditions of a portion of the transmission line associated with the protective relay, said characteristic timer measuring the time duration of the applied signal relative to a quantity representative of the frequency of the power source supplying the transmission line, said characteristic timer comprising:

(a) a clock source for developing a clock signal having a reference frequency;

(b) a divider counter for receiving the clock signal and generating a clock pulse train comprising a plurality of pulses having a predetermined pulse repetition rate proportional to the frequency of the power source;

(c) an up/down digital counter for receiving the applied and clock pulse train signals having a digital content that is altered in response to the presence and the absence of the applied signal at a rate determined by the repetition rate of the clock pulse train, the up/down counter generating a first digital signal representative of its digital content;

(d) selectable means for selecting one or more second digital signals each representative of a desired angle within the range of 0 to 180 degrees of one cycle of said power source;



(e) comparator means rendered effective by said applied signal and responsive when effective to the first digital signal and one or more of the second digital signals for generating a SET signal when the first digital signal is equal to or greater than one of the second digital signals; and,

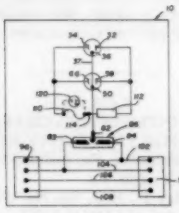
(f) means responsive to the SET signal for developing an output signal for the characteristic timer that extends past termination of said SET signal.

4,438,477

COMBINATION POWER AND COMMUNICATION LINE PROTECTION APPARATUS

John M. Cawley, East Islip, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,307
Int. Cl.³ H02H *9/06*
U.S. Cl. 361—119 **9 Claims**



1. A combination power and communication line protection apparatus comprising:

(a) a housing;

(b) a power plug disposed in said housing, said plug having at least three terminals adapted to be received by a power receptacle having two power line terminals and a ground terminal and be in electrical conductive contact with each of said terminals;

(c) a power receptacle disposed in said housing and connected in parallel with said power plug, said power receptacle being adapted to receive a mating power plug from equipment to be protected;

(d) first overvoltage protection means connected from one of said power line terminals to the other of said power line terminals for providing a low resistance current conducting path when the voltage thereacross exceeds a predetermined value;

(e) a pair of communication line receptacles having at least two electrically conductive paths therebetween disposed in said housing, each of said communication line receptacles being adapted to receive a mating communication line plug therein; and

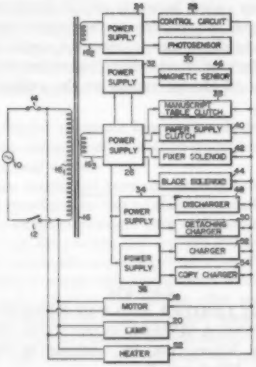
(f) a second overvoltage protection means having two line electrodes and a ground electrode, each said line electrode being connected to one of said respective communication lines, said ground electrode being connected to said power plug and power receptacle ground terminals.

4,438,478

POWER SUPPLYING APPARATUS

Kouszou Matsuyama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 9, 1982, Ser. No. 406,516
Claims priority, application Japan, Aug. 10, 1981, 56-124120
Int. Cl.³ H01H *47/10*
U.S. Cl. 361—152 **5 Claims**



1. A power supplying apparatus which comprises:

transformer means for converting a high voltage into a low voltage;

non-regulated power supplying means, connected to an output end of said transformer means, for supplying a no-load voltage higher than a full-load voltage;

at least one electromechanical converting means, connected to said non-regulated power supplying means, for instantaneously supplying an output greater than a rated output upon reception of an instantaneous voltage higher than a rated voltage from said non-regulated power supplying means, said at least one electromechanical converting means requiring for its initial operation a mechanical force larger than a mechanical force required in a steady state operation;

at least one load means connected to said non-regulated power supply means; and

control circuit means, connected to said output end of said transformer means, for supplying a control signal to said at least one electromechanical converting means so as to connect said at least one electromechanical converting means to said non-regulated power supply means so that the voltage close to the no-load voltage may be instantaneously supplied thereto, said control circuit means then supplying a control signal to said at least one load means so as to further connect said at least one load means to said non-regulated power supply means so that a substantially rated voltage may be supplied to said at least one load

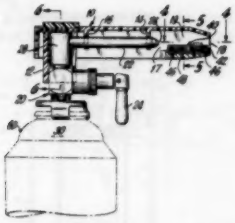
means and to said at least one electromechanical converting means.

4,438,479

SELF-CONTAINED ANTI-STATIC ADAPTER FOR COMPRESSED GAS DUST BLOWING DEVICES

Lionel H. Schwartz, Short Hills, N.J.; Scott W. Miller, Stratford, Conn., and Christopher N. Severud, Jr., Denville, N.J., assignors to Falcon Safety Products, Inc., Mountainside, N.J.

Filed Mar. 13, 1981, Ser. No. 243,559
Int. Cl.³ H05F 3/00
U.S. Cl. 361—213 **11 Claims**



1. A self-contained anti-static adapter for attachment to a compressed gas dust blowing device, said adapter for entraining air with a stream of gas from said blowing device and ionically charging this gaseous mixture to reduce forces of static attraction on surfaces to be dusted, the adapter comprising;

a housing;

securing means to secure the adapter to said blowing device;

an ionizing chamber formed within the housing, the ionizing chamber comprising:

an inlet at an upstream portion of the ionizing chamber to conduct a stream of gas from said blowing device and to entrain air in the gas stream,

a radioactive source to ionize the mixture passing through the ionizing chamber, the radioactive source being secured and enclosed within the ionizing chamber to physically shield the radioactive source and to confine the radioactive emissions primarily to within the ionizing chamber,

an outlet nozzle located at a downstream portion of the ionizing chamber to direct the stream of the ionizing mixture;

a front shell;

secondary securing means to secure the housing to the front shell;

a rear shell pivotally connected with the front shell, the front shell and rear shell together forming an enclosure for said blowing device; and

actuator means connected integrally with at least one of the shells to actuate said blowing device when the front shell and rear shell are squeezed together.

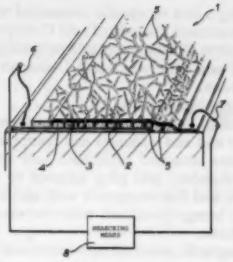
4,438,480

CAPACITIVE HYGROMETER

Bernard Chambaz, Seyssins; Gilles Delapierre, Seyssinet, and Louis Destannes, Eybens, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 9, 1981, Ser. No. 281,603
Claims priority, application France, Jul. 9, 1980, 80 15263
Int. Cl.³ H01G 7/00
U.S. Cl. 361—278 **7 Claims**

7. A capacitor constituted by a layer of dielectric material between two conductive faces, wherein one of the conductive faces, together with the dielectric material have numerous random fissures bringing the dielectric material into contact with the atmosphere in which the capacitor is placed each fissure scoring both the dielectric material and said conductive



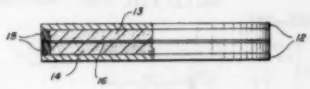
face with the electrical continuity of the fissured conductive face being maintained.

4,438,481

DOUBLE LAYER CAPACITOR

Jeffrey Phillips, Arlington Heights, and Hiroshi Takei, Wheeling, both of Ill., assignors to United Chemi-Con, Inc., Rosemont, Ill.

Filed Sep. 30, 1982, Ser. No. 429,311
Int. Cl.³ B01J 21/02; H01G 9/00
U.S. Cl. 361—433 **4 Claims**



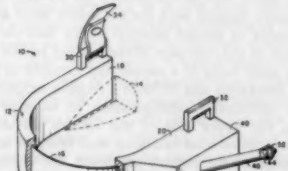
1. An electrical capacitor comprising a housing, a pair of electrodes in said housing, one of said electrodes being composed of a mixture of carbon particles and an electrolyte and the other electrode being composed of a mixture of lead metal and the same electrolyte, and an ionically conductive separator means between and in contact with said pair of electrodes, electronically separating said electrodes from each other, wherein the electrolyte comprises a solution of soluble sulfate salts of concentration in the range from 0.5 to 5 molar at an acid pH preferably not greater than 2.

4,438,482

ILLUMINATING DEVICE

Thomas B. Leon, 4028 Norton Ave., Oakland, Calif. 94602, and Michael D. Arpin, 6427 Thornhill Dr., Oakland, Calif. 94611

Filed May 31, 1983, Ser. No. 498,692
Int. Cl.³ F21L 15/08
U.S. Cl. 362—103 **3 Claims**



1. A shoe mounted lighting device comprising:

a generally U-shaped member adapted to engage a shoe proximate the heel thereof,

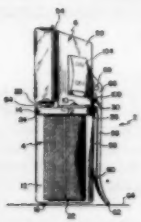
at least one battery,
means defining a container connected to said U-shaped member, said container adapted to house at least one battery,
means defining a first receptacle connected to said U-shaped member proximate the side of said U-shaped member, the axis of rotation of said receptacle projecting outwardly to the side of said shoe when said U-shaped member is engaged thereon,
an incandescent light source,
a rigid extension member having longitudinal axis of rotation, a first end and a second end comprising
a plug member attached proximate said first end of said extension member, said plug adapted to engage and be received by said first receptacle with said longitudinal axis of rotation being coincident with the axis of rotation of said receptacle,
a second receptacle attached proximate said second end of said extension member and adapted to receive and engage said incandescent light source, and
means for electrically connecting said incandescent light source to said container and said battery.

4,438,483

UTILITY HANDLAMP AND CHARGING COMPONENT MEANS THEREFOR

John E. Gulliksen, Shrewsbury; Roy A. Guimond, Holden; Charles F. Daly, Boylston, and William H. Hamilton, Lincoln, all of Mass., assignors to Koehler Manufacturing Co., Marlborough, Mass.

Filed Mar. 31, 1982, Ser. No. 363,660
Int. Cl.³ F21L 7/00
U.S. Cl. 362—183 **10 Claims**



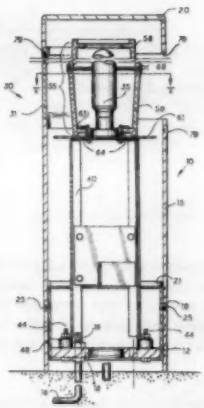
1. A utility hand lamp construction including a battery jar formed with a front side, a rear side and barrel shaped end portions joining the front and rear sides, a portion of the rear side lying between the barrel shaped portions being vertically recessed, battery cell members received in the battery jar and being electrically connected to one another internally of the battery jar to provide negative and positive battery terminals, a battery jar cover permanently secured to the top of the battery jar having positive and negative battery terminals extending therethrough, an enclosure body detachably fastened at the upper side of the battery jar cover, resilient clip means integrally formed with the enclosure body and extending downwardly in spaced relation to the said vertically recessed portion of the rear side of the battery jar for resiliently securing the hand lamp to a supporting member in suspended relationship therewith and to force a flexible supporting member into an undulating configuration to increase frictional engagement, the upper side of the battery jar cover being formed with a continuous retaining wall lying in spaced relation to the edge of the battery jar cover, the enclosure body being formed at an under side thereof with continuous mating edge means which is fitted around the said retaining wall, light source means received in the enclosure body and electrically connected through a switch to the negative and positive battery terminals, said retaining wall and mating edge means of the enclosure body cooperating to locate the resilient clip means in a desired spaced relationship to the vertically recessed portion of the battery jar and to resist displacement of the enclosure body on the battery jar cover and to inhibit entry of foreign material into the interior of the enclosure body.

4,438,484

LIGHTING BOLLARD FOR USE IN AN URBAN ENVIRONMENT

Joseph Winden, Grand Rapids, Mich., assignor to Urban Systems Streetscape, Inc., Grand Rapids, Mich.

Filed Sep. 20, 1982, Ser. No. 420,009
Int. Cl.³ F21V 29/00
U.S. Cl. 362—267 **31 Claims**



1. A vandal resistant, low elevation lighting bollard for providing indirect lighting in an urban environment comprising:
a slipfitter steel base adapted for anchoring in an area requiring illumination, said slipfitter steel base comprising a steel base plate with means for anchoring connected thereto and an upstanding steel support flange welded thereto;
a welded one-piece steel housing, said housing being received on said slipfitter base, said upstanding support flange having exterior dimensions smaller than the interior dimensions of said housing whereby said support flange is slidably received in said housing;
means for fastening said housing to said slipfitter base;
a one-piece window disposed below eye level in said housing, said window extending flush with a side of said housing and said window being formed from a tough impact resistant polycarbonate material.

4,438,485

EFFICIENCY SWITCHING-MODE POWER SUPPLY

William C. Voigt, 1970 Harrison St., San Francisco, Calif. 94103

Filed Dec. 21, 1981, Ser. No. 332,449
Int. Cl.³ H02M 3/335
U.S. Cl. 363—21 **10 Claims**

1. A switching mode, regulated power supply of the self-oscillating type wherein energy stored in the primary inductance of a transformer is delivered to the load during the flyback period of a cycle, for converting power from a direct-current source, which may be unregulated, into regulated direct current, at stabilized, selected voltage levels, comprising:
a first transistor;
a first transformer having a primary winding and at least one secondary winding, the first end of the primary winding being connected to the direct current source;
a first resistor the first end of which in connected to the

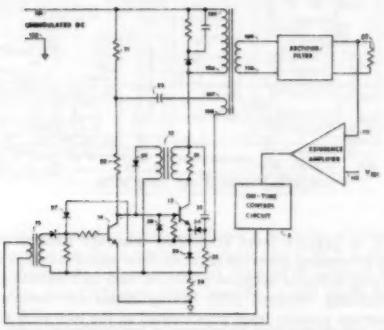
emitter of the first transistor, the second end of which is connected to the direct current source return;

a first capacitor the first end of which is connected to the second end of the first transformer's primary winding;

a first diode the first terminal of which is connected to the second terminal of the capacitor, the second terminal of which is connected to the junction of the emitter of the first transistor and the first end of the first resistor such that current flow through the capacitor will flow through the diode during the flyback period;

a second resistor the first end of which is connected to the junction of the first capacitor and the first diode, the second end of which is connected to the first end of the first resistor;

first control means for controlling the turn-off of the first transistor in response to a command signal;



means for initiating current flow in the base of the first transistor at the beginning of each cycle and for maintaining said current flow until terminated by the first control means in response to a command;

means for rectifying the voltages produced during flyback of the primary of the first transformer;

means for sensing the rectified voltages and for generating an error signal which is proportional to the difference in the rectified secondary voltages and a stable reference voltage;

means for generating a command signal in response to the error signal such that the first control means terminates base current flow in the first transistor at the correct time to control the primary current build-up in the primary of the first transformer so that the energy delivered to the secondary with each pulse is similarly controlled, thereby regulating the output voltage.

4,438,486

LOW LOSS SNUBBER FOR POWER CONVERTERS

Angelo Ferraro, Stillwater, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,372
Int. Cl.³ H02H 7/12; H02M 7/537
U.S. Cl. 363—56 **11 Claims**

1. A low loss snubber for providing stress relief to a first controllable semiconductor switch comprising:

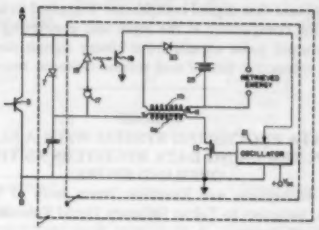
a series combination of a diode and a capacitor connected across said first switch, said diode poled to conduct current to charge said capacitor when said first switch opens; and

an energy retrieval converter for removing energy from said capacitor when said first switch is closed including

a second controllable semiconductor switch;

means responsive to the conductive state of said first switch and coupled to said second switch for repeatedly opening and closing said second switch when said first switch is in the closed position;

inductor means coupled in series with said second switch and said capacitor, said inductor means receiving energy from said capacitor at a rate dependent upon the repeated opening and closing of said second switch; and



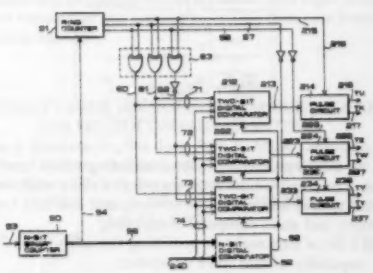
means coupled to said inductor means for receiving energy from said inductor means and transferring said energy to an external load.

4,438,487

DIGITAL PHASE-SHIFTING CIRCUIT

Jyoji Kawai, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 389,066
Claims priority, application Japan, Aug. 19, 1981, 56-169876
Int. Cl.³ H02M 7/155
U.S. Cl. 363—129 **7 Claims**



1. A digital phase-shifting circuit for igniting sequentially plural thyristors connected across a polyphase power supply, comprising:

(a) a first binary N bit counter triggered by clock signals with frequency of $2^N \times 6$ times that of said power supply,

(b) a second counter composed of a divide-by-six ring counter triggered by a most significant bit signal of said first counter,

(c) an N bit-first digital comparator for comparing a binary output signal consisting of N bits with less significant N bits of a phase reference signal consisting of N+2 bits and generating an output signal in the case where said binary output signal consisting of N bits is larger than said less significant N bits of said phase reference signal,

(d) an exclusive OR circuit generating three types of phase signals having a binary 2 bit phase difference of every 60° from one another and effecting a repeating operation of 180° period by utilizing an output signal consisting of 3 bits derived from said second counter as the input,

(e) a second digital comparator having three types of 2 bit constructions comparing phases with each other by utilizing more significant 2 bits selected from three types of binary output signals consisting of 2 bits generated from said exclusive OR circuit and said phase reference signal consisting of N+2 bits as the input signal, and

(f) three same type pulse circuits functioning to correspond

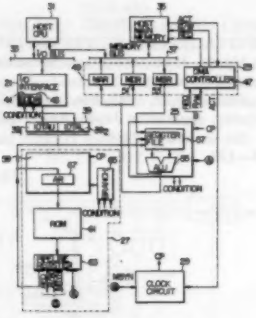
each output signal from said three types of second digital comparators having a different phase of every 60° from each other to each output signal from said second counter consisting of 3 bits by dividing separately said output signals with every 1 bit at the time when an output signal from said first digital comparator is applied to said second digital comparator as the input and generating two types of output pulse signals from binary signals consisting of the respective bits of said second counter, respectively.

4,438,488

DATA PROCESSING SYSTEM WITH A SLAVE COMPUTER USING DATA REGISTERS AS THE SOLE OPERAND STORE

Shigeki Shibayama, and Kazuhide Iwata, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 18, 1980, Ser. No. 160,490
Claims priority, application Japan, Jun. 26, 1979, 54/79662
Int. Cl.³ G06F 9/38, 15/332
U.S. Cl. 364—200 8 Claims



1. In a data processing system including a host central processing unit and a host main memory, a slave computer connected to said host central processing unit and said host main memory said slave computer comprising:

(a) a set of data registers providing the sole operand storage capability of said slave computer;

(b) arithmetic logic operating means, coupled to said data registers and having an operation cycle time shorter than the memory cycle time of said host main memory, for performing computations involving the operands in said data registers and for computing addresses for a said host main memory;

(c) DMA interface means connected to said host main memory, to said data registers, and to said arithmetic logic operating means for transferring data from said host main memory directly to said arithmetic logic operating means through said data registers and for directly loading the results of computations by said arithmetic logic operating means into said host main memory;

(d) microprogram control means connected to said arithmetic logic operating means and to said DMA interface means for controlling the operation of said microprogram control means and said DMA interface means;

(e) input/output interface means connected between said central processing unit and said microprogram control means to transfer command information from said host central processing unit to said microprogram control means; and

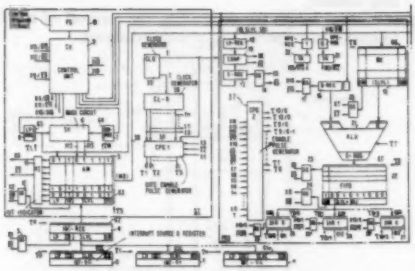
(f) clock circuit means connected to said arithmetic logic operating means and to said microprogram control means for generating slave computer system clocks which operate independently of any clock signals in said host central processing unit or in said host main memory.

4,438,489

INTERRUPT PRE-PROCESSOR WITH DYNAMIC ALLOCATION OF PRIORITY LEVELS TO REQUESTS QUEUED IN AN ASSOCIATIVE CAM

Hans J. Heinrich, Kirchheim, and Dieter Schütt, Munich, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,606
Claims priority, application European Pat. Off., Sep. 27, 1980, 80105870.2
Int. Cl.³ G06F 9/00, 9/46
U.S. Cl. 364—200 6 Claims



1. A priority level controlled interrupt handler unit for pre-processing interrupt requests from plural interrupt sources having different assigned priorities, said unit including plural processing elements (PE) having means for comparing an interrupt priority level preallocated to the unit with an interrupt level of an incoming interrupt request, means for buffering incoming interrupt requests when a comparison match occurs, means for generating and buffering real addresses associated with incoming requests, each address designating a starting address of a routine for servicing the respective incoming request, and at least one instruction address register means in which real addresses are staged for initiating servicing routines, wherein the improvement comprises,

common control means (6 to 10; FIG. 2) for initializing said unit by assigning interrupt levels (LV) to said processing elements and for establishing level masking conditions (MA), and for producing control signals (e.g. X4/X4, X11/X11, X16/X16) from which other control signals (e.g. X5/X5, X9/X9, X10/X10, X12/X12, X15/X15) are generated individually in the processing elements,

associative storage means (5) in said common control means and a main bus (38) connecting the output of the associative storage means to all PE's,

means for storing interrupt requests in the associative storage means, each request including an interrupt level, and for selecting requests for transfer to a PE by means of an associative search operation relative to an associated interrupt level (e.g. LV=i) designated by the common control means,

control registers (RPE, OPE) in each processing element and means connecting the control registers to be set by the common control to show the status of each PE as neutral, standard, reserve, or old, the old status identifying a PE having an overflow in its means for storing interrupt requests, means for indicating when a standard processing element associated with a specific interrupt level (i) overflows, or is otherwise blocked, and means in the common control for selecting and assigning a neutral PE as a reserve processing element for that level, and

blocking means (X4, X16) in the common control for blocking servicing of interrupt requests which are queued in PE's having assigned level priorities lower than requests currently being serviced or, if a reserve PE has been allocated to a current interrupt level, for blocking the

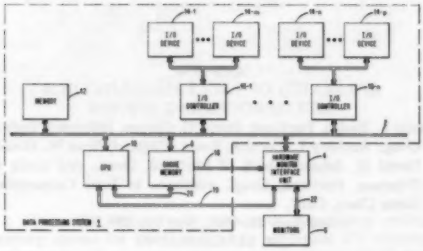
processing of the interrupt requests in that reserve PE until all interrupt requests of the old PE assigned to said current level have been processed.

4,438,490

CLOCK CONTROL OF A CENTRAL PROCESSING UNIT FROM A MONITOR INTERFACE UNIT

Richard P. Wilder, Jr., North Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 1, 1981, Ser. No. 307,564
Int. Cl.³ G06F *11/30, 1/04*
U.S. Cl. 364—200 6 Claims



1. A data processing system includes a plurality of subsystems, a main memory, a central processor unit (CPU), a cache and a plurality of I/O controllers, all coupled in common to a system bus, said CPU also being coupled to said cache by a separate bus,

a monitor interface unit is coupled to said system bus, said cache by a cache bus and said CPU by a CPU bus for monitoring information transferred over said system bus, information transferred between said CPU and said cache and internal CPU information, a monitor is coupled to said monitor interface unit for receiving hit signals indicative of predetermined information for generating data processing system performance data, apparatus in said monitor interface unit generates a stop clock signal having a fixed predetermined cycle time, said stop clock signal being applied to said CPU via said CPU bus, said CPU having clock control means responsive to states of said stop clock signal for starting and stopping a CPU clock signal resulting in a CPU clock signal cycling at said fixed predetermined cycle time which causes the starting or stopping of the CPU operation, said apparatus comprising:

a mode switch for generating a clock stop enable signal;

first one-shot multivibrator means responsive to said CPU clock signal, said clock stop enable signal and a potentiometer resistance value setting for generating a first and a second stretched pulse signal wherein said first and said second stretched pulse signals are complementary signals;

first latch means responsive to said CPU clock signal and said first stretched pulse signal for setting an output of said first latch means to a first state;

second one-shot multivibrator means responsive to said second stretched pulse signal for generating a delayed stretched pulse signal;

second latch means responsive to said clock stop enable signal, said delayed stretched pulse signal and said second stretched pulse signal for generating a stop reset signal, said first latch means being responsive to said stop reset signal for setting said output to a second state;

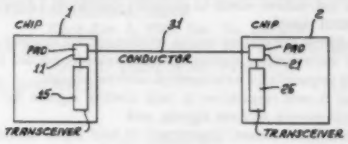
third latch means enabled by a reset switch signal and responsive to the generation of a predetermined hit signal for setting an output of said third latch means to a first state; and NOR gate means responsive to said outputs of said first and third latch means for generating said stop clock signal to said CPU.

4,438,491

COMPUTER HAVING PLURAL IC CHIPS WITH EACH CHIP INCLUDING A TRANSCEIVER

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Filed Oct. 14, 1980, Ser. No. 196,201
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 30 Claims



1. In a computer with monolithic IC chips interconnected for data transfers, the improvement to reduce the number of interconnections between chips including:

at least some IC chips with a first chip area devoted to one or more logic circuits, a second chip area devoted to interfacing means, and a third chip area devoted to at least one of a transmitter and receiver connected between said logic circuits and said interfacing means,

said interfacing means comprising one or more pads each connected to a conductor for carrying analog signals for interconnecting said IC chips,

said transmitter for receiving first signals from said logic circuits and providing second signals to said interfacing means, and

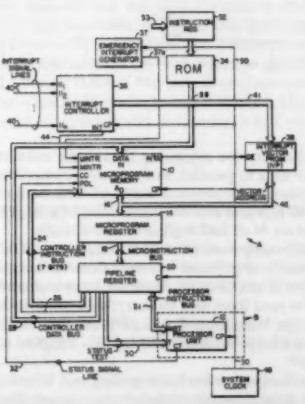
said receiver for receiving third signals from said interfacing means and providing fourth signals to said logic circuits, said transmitter and receiver including means for handling analog signals.

4,438,492

INTERRUPTABLE MICROPROGRAM CONTROLLER FOR MICROCOMPUTER SYSTEMS

William J. Harmon, Jr., San Jose; John R. Mick, Cupertino, and Vernon Coleman, Oakland, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 1, 1980, Ser. No. 174,323
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 10 Claims



1. A microprogram controller having output means for generating through said output means microinstruction address signals used to access a program memory element containing a plurality of microinstructions, there being a first register means connected to said memory element for receiv-

ing and temporarily holding microinstructions accessed from said memory element by said microinstruction address signals and bus means for communicating a portion of said accessed microinstruction from said first register means to said microprogram controller, said microprogram controller comprising:

input means connected to said bus means for receiving instruction words and data words;

decode means connected to said input means for receiving said instruction words to generate therefrom a plurality of control signals;

first address generating means, having second register means and incrementing means operably interconnected to provide sequentially incremented address signals;

storage means responsive to said control signals for selectively storing address signals; and

first multiplex means, connected to said input means, said first address generating means and said storage means, for selectively coupling said input means, said first address generating means, and said storage means to said output means in response to said control signals, said first address generating means and said storage means further connected to a first multiplex output terminal means for receiving signals therefrom in response to said control signals;

whereby said microinstruction address signals are generated.

4,438,493

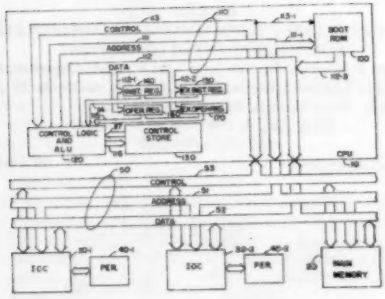
MULTIWORK MEMORY DATA STORAGE AND ADDRESSING TECHNIQUE AND APPARATUS

David E. Cushing, Chelmsford, and Philip E. Stanley, Westboro, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 6, 1981, Ser. No. 280,720

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **8 Claims**



7. A memory for retrieving N multiple consecutive logical words of data in parallel, said memory comprising:

A. a plurality of physical words of data, each of said plurality of physical words of data being of a length sufficient to contain N of said logical words of data;

B. addressing means for addressing a specified one of said plurality of physical words of data by using an address of a first of said N multiple consecutive logical words of data to be read from said memory, said memory having stored therein N multiple copies of each of said logical words of data, except for a first and last N−1 logical words of data; and

C. data output means for receiving said N multiple consecutive logical words of data from said specified one of said plurality of physical words of data read from said memory in the time required to read one of said physical words of data and wherein each of said physical words of data contains N multiple consecutive logical words of data having N consecutive logical addresses and wherein said first of said N multiple consecutive logical words of data has a logical address corresponding to a physical address of said physical word of data in which it is stored and whereby said reading of said N multiple consecutive logical words of data does not require any address incrementing or decrementing to read any group of said N multiple consecutive logical words of data and wherein a first through N−1 logical words of data, within any said group of said N multiple consecutive logical words of data as read from said memory, is located in the same relative position within said physical words of data without requiring any alignment of said logical words of data within said data output means.

4,438,494

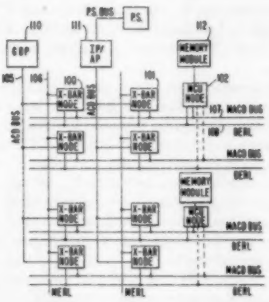
APPARATUS OF FAULT-HANDLING IN A MULTIPROCESSING SYSTEM

David L. Budde, Portland; David G. Carson, Hillsboro, both of Oreg.; Anthony L. Cornish, Essex, England; Brad W. Hosler; David B. Johnson, both of Portland, Oreg., and Craig B. Peterson, Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 25, 1981, Ser. No. 296,025

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—200 **10 Claims**



1. In a data processing system in which a switching matrix provides electrical interconnections between horizontal MACD buses and vertical ACD buses connected in said matrix by means of nodes, a fault-handling mechanism comprising:

an error-reporting matrix including horizontal Bus Error Report Lines (BERLs) and vertical Module Error Report Lines (MERLs),

said BERLs being associated with said MACD buses such that all nodes sharing an MACD bus are connected with a BERL,

said MERLs being associated with said ACD buses such that all nodes sharing an ACD bus are connected with a MERL; and,

error-reporting means connected at the intersection of one of said MERLs and one of said BERLs,

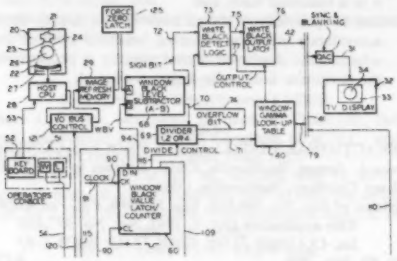
said error-reporting means including receiving means connected to said MERL for receiving first error messages, said first error messages being transmitted over said one MERL,

said error-reporting means further including propagating means connected to said receiving means and said one BERL, responsive to said receiving means for propagating second error messages over said one BERL to other error-reporting means located at said other nodes in said matrix.

4,438,495
TOMOGRAPHY WINDOW-LEVEL GAMMA FUNCTIONS

Arthur K. Collins, Waukesha; Edward W. Andrews, Brookfield, and Nallaswamy Srinivasan, Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,008
Int. Cl.³ G06F 15/42; H04N 5/14
U.S. Cl. 364—414 4 Claims



1. Computed tomography apparatus comprising refresh memory means for storing an array of digital CT numbers having values in a predetermined range wherein the values correspond to the intensities of the pixels that compose an x-ray image, means for converting digital values related to the CT number values to corresponding analog video signals, television means responsive to said video signals by displaying an optical version of said x-ray image, means for selecting the level and width of a window which width is defined between an upper limit CT number and a lower limit CT number that is designated as the window black value, and means for converting said CT number values within the window to gamma corrected values before they are converted to video signals, said last-named means including:

gamma lookup table storing memory means whose addresses contain a lookup table of digital gamma corrected data values for the respective CT numbers within said range, said gamma lookup table memory means having address input means and a data output port,

a window-gamma lookup table memory means having a port for data input coupled to the output port of said gamma lookup table memory means and having address input means,

address producing means responsive to occurrence of a vertical blanking pulse for said television means by producing a sequence of addresses to said window-gamma lookup table memory means,

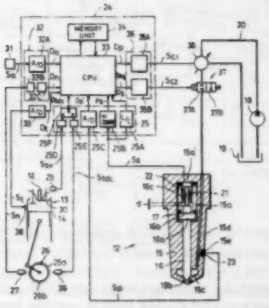
variable rate address generator means operative concurrently with said address producing means to provide a sequence of addresses to said gamma lookup table memory means, said last-named addresses being provided at such rate that the last gamma lookup table address is addressed at the same time that the last window-gamma lookup table address corresponding to said upper window limit is addressed, said gamma lookup table memory means responding to an address by output of gamma correction data at the address to the address in said window-gamma lookup table memory means that is currently being addressed by said address producing means, and

subtractor means operative after termination of a vertical blanking interval to subtract said window black value from successive CT number values that are stored in said refresh memory, the CT number difference values resulting from subtraction of CT number values within the window constituting addresses to said memory storing said window-gamma lookup table, said memory responding to successive addresses by output of the gamma corrected digital values corresponding to the CT number difference values at video rate to said means for converting said digital values to analog video signals to which said television means responds by displaying the image.

4,438,496
ELECTRONIC FUEL INJECTION FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Tomonori Ohie, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Jun. 3, 1981, Ser. No. 269,878
Claims priority, application Japan, Jun. 11, 1980, 55-78691
Int. Cl.³ F02M 51/06; F02D 5/02
U.S. Cl. 364—431.05 15 Claims



1. A method for controlling the injection of fuel being injected into at least one cylinder of an internal combustion engine through a fuel injection valve having a nozzle holder and a nozzle needle arranged within said nozzle holder, said method comprising the steps of: (1) detecting the lift amount of said nozzle needle of said fuel injection valve by means of a nozzle needle lift sensor arranged within said nozzle holder; (2) detecting fuel pressure present in an injecting fuel passage in said nozzle holder by means of a pressure sensor; (3) arithmetically calculating an actual value of fuel injection quantity from the detected values of nozzle needle lift and fuel pressure in said injecting fuel passage by means of electronic computer means; (4) detecting the values of factors indicative of the operating condition of said engine; (5) arithmetically calculating a required value of fuel injection quantity from the detected values of said factors by means of electronic computer means; (6) arithmetically calculating the difference between said calculated required value of fuel injection quantity and said calculated actual value of fuel injection quantity; and (7) controlling the quantity of fuel to be injected into said cylinder during the next fuel injection with reference to said calculated difference.

4,438,497
ADAPTIVE STRATEGY TO CONTROL INTERNAL COMBUSTION ENGINE

Frederick G. Willis, Ann Arbor; Richard R. Radtke, Plymouth; Joseph Ellison, Detroit; Steven R. Fozo, Westland, and Glenn A. Kern, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 20, 1981, Ser. No. 285,221
Int. Cl.³ G01M 15/00; G05B 13/02; F02B 5/02
U.S. Cl. 364—431.05 26 Claims

1. A method for controlling the performance of a spark ignited automobile internal combustion engine using exhaust gas recirculation, the engine being responsive to the magnitude of engine control parameters, said method including the steps of:

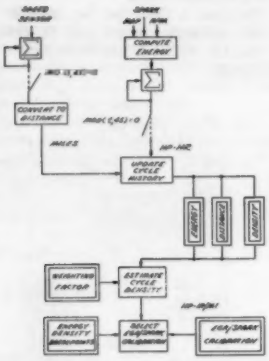
establishing a duration of time to determine the frequency of updating the engine control parameters;

determining the energy density output of the engine over the

first duration of time, wherein energy density output is the energy output divided by the distance traveled during the first duration of time;

maintaining a history of distance traveled and energy output during a plurality of successive consecutive durations of time;

estimating the magnitude of energy density output of the engine during the next duration of time;



establishing a lookup table for EGR and spark advance as functions of engine torque, engine speed, and engine energy density;

selecting a value from the table as a function of the estimated energy density for use during the next duration of time; and

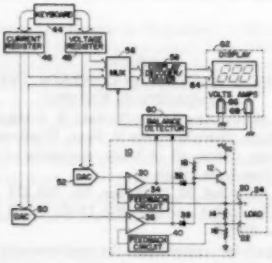
controlling the engine EGR and engine spark advance in accordance with the value selected from the table as a function of the estimated energy density thereby improving engine operation for higher efficiency.

4,438,498

POWER SUPPLY OUTPUT MONITORING METHOD AND APPARATUS

Stephen M. Sekel, Beaverton; Rodney G. Strange, Aloha, and Robert F. Verrinder, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 13, 1981, Ser. No. 282,476
Int. Cl.³ G05F *1/02*
U.S. Cl. 364—483 **10 Claims**



2. In a power supply having a pair of control circuits for providing voltage-supplying and current-supplying operating modes, a power supply monitoring apparatus, comprising:

means for providing digital numbers representative of power supply voltage and current limit values;

means for producing in one of said pair of control circuits one of the voltage and current limit values in accordance with said digital numbers, wherein the control circuit producing the limit value is in a balanced state while the other control circuit is in an unbalanced state;

means for detecting which one of said pair of control circuits is in a balanced state; and

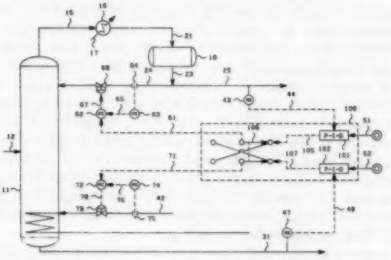
means for providing a digital number to a display device in accordance with the detected balanced control circuit, wherein the displayed digital number is proportional to the particular limit value being produced.

4,438,499

FRACTIONAL DISTILLATION PROCESS CONTROL

Bruce A. Jensen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 184,845, Sep. 8, 1980, Pat. No. 4,316,255.
This application Oct. 1, 1981, Ser. No. 307,453
Int. Cl.³ G06F *15/46*; G05B *11/42*; B01D *3/42*
U.S. Cl. 364—501 **6 Claims**



1. A method for controlling a fractional distillation process comprising the steps of:

establishing a first signal representative of the concentration of at least one component in a first product stream withdrawn from said fractional distillation process;

establising a second signal representative of the desired concentration of said at least one component in said first product stream;

applying said first signal and said second signal to a first controller means to thereby establish a third signal which is responsive to the difference between said first signal and said second signal;

establishing a fourth signal representative of the concentration of at least one component in a second product stream withdrawn from said fractional distillation process;

establishing a fifth signal representative of the desired concentration of said at least one component in said second product stream;

supplying said fourth signal and said fifth signal to a second controller means to thereby establish a sixth signal responsive to the difference between said fourth signal and said fifth signal;

establishing primary first tuning constants for said first controller means for use when said first controller means controlling a primary process variable;

establishing secondary first tuning constants for said first controller means for use when said first controller means in controlling a secondary process variable;

establishing primary second tuning constants for said second controller means for use when said second controller means is controlling said primary process variable;

establishing secondary second tuning constants for said

second controller means for use when said second controller means is controlling said secondary process variable;
designating said first product stream as a primary product stream;
supplying said primary first tuning constants to said first controller means;
storing said secondary first tuning constants in memory;
supplying said secondary second tuning constants to said second controller means;
storing said primary second tuning constants in memory;
manipulating said primary process variable in response to said third signal; and
manipulating said secondary process variable in response to said sixth signal.

4,438,500

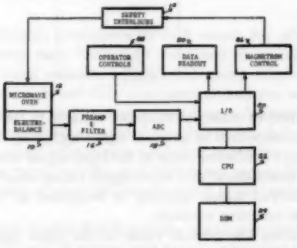
RAPID VOLATILITY ANALYZER

Michael J. Collins, Matthews; Bernard W. Cruse, Jr., Indian Trail, and Ronald J. Goetchius, Charlotte, all of N.C., assignors to CEM Corporation, Indian Trail, N.C.

Continuation-in-part of Ser. No. 603,354, Aug. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 381,087, Jul. 20, 1973, Pat. No. 3,909,598. This application Apr. 13, 1979, Ser. No. 29,883

Int. Cl.³ G06F *15/46;* G01N *5/04*

U.S. Cl. 364—567 **30 Claims**



1. An apparatus for measuring the volatile content of substances comprising electronic weighing means, microwave heating means including an enclosed heating chamber and a microwave energy source transmittably connected therewith, data acquisition and apparatus control means and information readout means, said electronic weighing means being at least partially positioned within said microwave heating means, said apparatus control means being electrically connected to and preset to sequentially actuate said weighing means and microwave heating means, said data acquisition and apparatus control means being further set to periodically sense said electronic weighing means a plurality of times and to provide an electrical output signal representative of said weight sensing, said data acquisition and apparatus control means further having means for projecting the anticipated weight change during said microwave heating to produce a further electrical output signal proportional to the anticipated weight change, said electrical output signals being electrically connected to said information readout means.

4,438,501

ANTILATCHUP PSEUDORANDOM BINARY SEQUENCE GENERATOR

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Feb. 16, 1982, Ser. No. 348,844

Int. Cl.³ H03K *3/84;* H03B *29/00*

U.S. Cl. 364—717 **11 Claims**

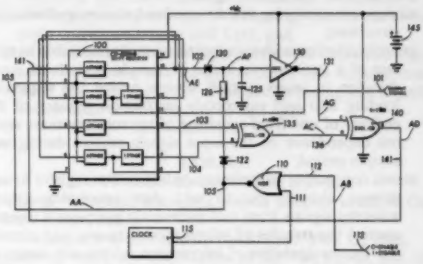
1. Antilatchup pseudorandom binary sequence generator means providing an irregular continuum of binary states whereby said generator includes at least:

a. source of effective clock signal;

b. binary shift register means including a clock input thereto coupled with said source, having at least one data signal input and plural effectively paralleled outputs;

c. combinatorial logic gate means having at least two inputs coupled to said register plural outputs to combine the said register outputs into an effectively irregular binary feedback signal;

d. selectable inverter means, effectively including a control input and a signal input coupled with said gate means to effectively receive said binary feedback signal, providing an output therefrom which is effectively coupled to said register data signal input;



e. state sequence detector means, having an input coupled to said register plural outputs, effective for at least producing a first level signal at an output therefrom for a shift register sequence which comprises a continuum of properly irregular binary states, and a second level signal at said output therefrom for a shift register sequence which comprises a continuum of substantially constant disallowed binary states, said level signals coupled to said control input of said selectable inverter means, whereby said second level signal in conjunction with the said selectable inverter means produces relative inversion of the binary feedback signal.

4,438,502

OUTPUT PROCESSING SYSTEM FOR A DIGITAL ELECTRONIC MUSICAL INSTRUMENT

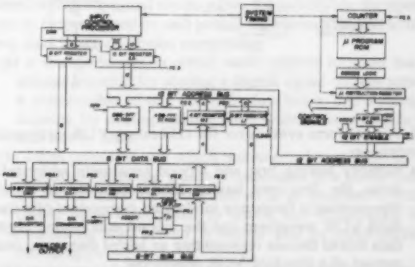
Hugh M. Fox, 61 Eastville Ter., Harrogate, and Peter H. Sutcliffe, 71 Warwick Rd., New Barnet, both of England

Continuation of Ser. No. 199,902, filed as PCT GB79/00208, Dec. 10, 1979, published as WO 80/01215, Jun. 12, 1980, § 102(e) dated Jul. 21, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 409,801

Claims priority application United Kingdom, Dec. 11, 1978, 47901; Aug. 7, 1979, 7927450

Int. Cl.³ G06F *1/02;* G10H *1/06*

U.S. Cl. 364—718 **2 Claims**



1. A sound producing system for a polyphonic electronic musical instrument, the system being responsive to digital input signals relating at any given time to frequency, amplitude and waveform selection for each of the notes sounding concurrently at that time and comprising:

an input signal digital storage circuit for storing said digital

input signals and means for loading said digital input signals into said storage circuit;

a wave shape digital storage circuit containing tabular digital information representative of each of a plurality of wave shapes;

a data processing circuit comprising data register and adder means;

means interconnecting the digital storage circuits and the data processing circuit for the transfer of information therebetween;

a microcode instruction register;

storage means storing at least one fixed sequence of microinstructions;

microinstruction address sequencing means operable in each one of a consecutive series of sample periods of equal duration to cause in each sample period the sequential loading into said microcode instruction register of the entirety of one fixed sequence of microinstructions without dependence on the input signals present during said sample period;

means connecting said microcode instruction register to said storage circuits and to said data processing circuit whereby signals from said microcode instruction register control the transfer of information between said circuits and the manipulation of information within said ciruits so as to calculate the current value of all notes sounding within said sample period;

a converter circuit comprising a register and a digital to analogue converter; and

means applying said current value to said converter circuit so as to produce an analogue signal representative of the required sound during said sample period.

4,438,503

WAVEFORM SYNTHESIZERS

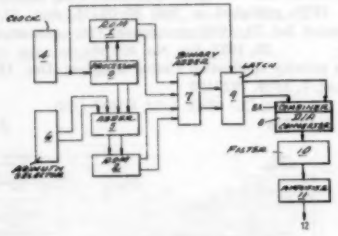
Robert A. White, Shepperton, and Ralph W. Yell, Hampton, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 13, 1981, Ser. No. 263,202

Claims priority, application United Kingdom, May 13, 1980, 8015877

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—721 **14 Claims**



1. A waveform synthesizer for calibrating VOR equipment, comprising:

a memory having first and second separately addressable areas, the first area having digital data stored therein representing a frequency modulated component of a standard VOR waveform and the second area having digital data stored therein representing an added sine wave component of a standard VOR waveform;

azimuth selector means, adapted to be manipulated by an operator, for selecting an azimuth to be simulated by said synthesizer;

a cyclic memory addressor, coupled to said azimuth selector means and to said memory, for (a) addressing the first and second memory areas, the address of the second area being offset by an amount related to the azimuth selected via said azimuth selector means and (b) providing digital data read from said first and second memory areas defining a waveform to be synthesized;

converter means, coupled to said cyclic memory addressor, for converting said digital data read from said first and second memory areas into an analog signal of a form suitable for coupling to said VOR equipment.

4,438,504

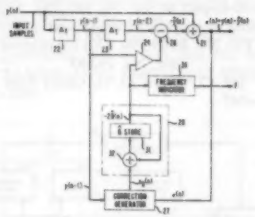
ADAPTIVE TECHNIQUES FOR AUTOMATIC FREQUENCY DETERMINATION AND MEASUREMENT

David L. Favin, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 15, 1981, Ser. No. 273,612

Int. Cl.³ G06F *15/34*

U.S. Cl. 364—724 **3 Claims**



1. A method of tuning an adaptive variable to the frequency of a signal component in an input signal including the steps of

a. forming a predicted value of the input signal using derived signal quantities of past input signal values wherein at least one derived signal quantity is weighted in accordance with an adaptive variable,

b. comparing the present value of the input signal to the predicted value to generate an error signal,

c. using at least one of the derived signal quantities and said error signal to produce a correlation between the predicted value and the signal component of said input signal, and tuning said adaptive variable by changing said adaptive variable incrementally based on said correlation in a manner to have a prescribed relationship to the frequency of the signal component in said input signal and to reduce the magnitude of said error signal, and

d. checking the magnitude of the input signal and allowing the preceding steps to be repeated when the magnitude of the input signal exceeds a prescribed threshold.

4,438,505

ELECTRONIC DICTIONARY AND LANGUAGE INTERPRETER WITH AUTO-SEARCH KEY FOR DERIVING A FULL-LENGTH WORD AND ITS ASSOCIATED TRANSLATION WORD BASED ON A PARTIAL WORD ENTERED

Shigenobu Yanagiuchi, Tenri, and Mituhiro Saizi, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1980, Ser. No. 119,662

Claims priority, application Japan, Feb. 9, 1979, 54-14813

Int. Cl.³ G06F *15/38*

U.S. Cl. 364—900 **11 Claims**

1. An electronic word conversion device wherein a first word or words represented in a first language are entered to obtain a second word or words represented in a second language equivalent to the first word or words, comprising:

input means operable for entering a partial word in said first language, said partial word containing at least one character;

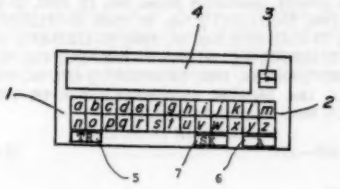
means for storing a plurality of full-length words in said first

language and their associated translated words in said second language;

means for addressing the storing means so as to search the plurality of full-length words and their associated translated words;

means for selecting at least one of said full-length words containing letters corresponding to the letters contained within said partial word;

auto-search means responsive to a single actuation of an auto-search key for selectively driving said means for selecting to repetitively enable said addressing means to select a plurality of full-length words having one or more characters common to the partial word and the translated words corresponding to said full-length word;



display means, responsive to said means for selecting, for indicating each full-length word and its associated translated word selected by said addressing means; said full-length words and their associated translation words being separated in said storing means from adjacent full length words and their associated translation words by first separation code information, said first separation code information being used by said addressing means to locate the beginning of each full-length word in said storing means; and

auto-search enable flip-flop being set to selectively activate said auto-search means; said device, when said auto-search means is disabled by resetting said flip-flop to place said device in a single scanning mode, displaying only a single full-length word and its associated translation.

4,438,506

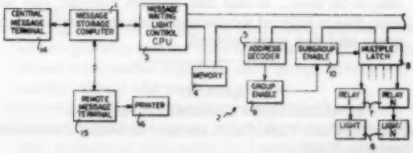
MESSAGE WAITING LIGHT CONTROL SYSTEM

Alan R. Strom, Roeland Park, Kans., assignor to H & K Computer Corporation, Kansas City, Mo.

Filed Aug. 4, 1981, Ser. No. 290,375

Int. Cl.³ G06F *15/20*; H04M *1/00*

U.S. Cl. 364—900 **10 Claims**



1. A message waiting light control system for activating and deactivating message waiting lights in response to the storage and deletion of texts of messages in a message storage computer, said system comprising:

(a) a plurality of message waiting lights positioned respectively at a plurality of stations, each light upon being activated indicating the existence of a message for an occupant of the station at which said light is positioned, each light being associated with a unique identification code;

(b) a message waiting light control computer operatively connected to said lights and controlling the activation and deactivation of said lights, said light control computer including memory means;

(c) interface means connecting said light control computer to a message storage computer including message entry means, message display means, and a message memory for the storage of the texts of messages therein; and

(d) said light control computer being programmed to effect:

(1) the activation of a message waiting light in response to the entry of the text of a message into said entry means and the entry and execution by the message computer of a message waiting command including the identification code corresponding to said light; and

(2) the deactivation of said light in response to the entry into said entry means and the execution by said message computer of a message delete command including said identification code corresponding to said light.

4,438,507

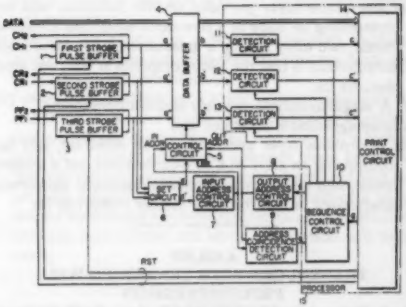
INPUT SIGNAL CONTROL DEVICE

Yoshinori Nakajima, Kanagawa, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 233,947, Feb. 12, 1981, abandoned, which is a continuation of Ser. No. 51,986, Jun. 25, 1979, abandoned. This application Sep. 10, 1981, Ser. No. 300,804

Int. Cl.³ G06F *3/12*

U.S. Cl. 364—900 **8 Claims**



1. An interface device of the type for sequentially applying to a printer information for controlling said printer, said information being transmitted on common data buses and strobe lines from a source device whose data processing speed is faster than that of said printer, said information for controlling said printer consisting of digital data signals transmitted on said common data buses and strobe pulses for identifying the operations to be performed by said printer transmitted on said strobe lines, said interface device comprising:

(a) a storage means in which each address location has a storage location for storing a digital signal therein which is connectable to said common data buses, and a storage location for storing a strobe pulse which is connectable to said strobe lines;

(b) a first control means which is connected to at least one of said strobe lines and which is responsive to a strobe pulse on said at least one strobe line so as to generate a write-timing pulse in response to which said information for controlling said printer is stored and an input-address changing pulse;

(c) an input-address control means for specifying an input address of said storage means into which said information for controlling said printer is to be stored, and for changing an input address specified in response to said input-address changing pulse; and

(d) an output-address control means for specifying an output address of said storage means from which said information

for controlling said printer may be sequentially read out in the order said printer information is stored in said storage means.

4,438,508

MAGNETO-OPTICAL MEMORY ELEMENT

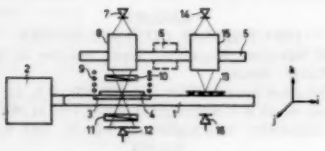
Marlies Urner-Willie, Hamburg, and Peter Hansen, Appen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 132,747, Mar. 24, 1980. This application May 27, 1981, Ser. No. 268,027

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2911992

Int. Cl.³ G11C *13/06*

U.S. Cl. 365—122 **8 Claims**



1. A magneto-optical memory element comprising: a nonmagnetizable substrate; and

an amorphous layer provided on the substrate, said layer comprising an alloy of a rare-earth metal and a transition metal, said alloy having a uniaxial magnetic anisotropy;

Characterized in that the alloy comprises at least one atomic percent tin.

5. A magneto-optical memory element comprising:

a nonmagnetizable substrate; and

an amorphous layer provided on the substrate, said layer comprising an alloy of a rare-earth metal and a transition metal, said alloy having a uniaxial magnetic anisotropy;

characterized in that the alloy further comprises tin.

4,438,509

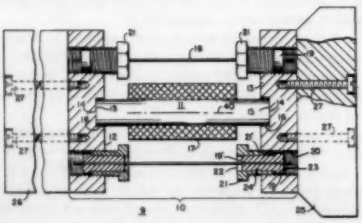
TRANSDUCER WITH TENSIONED-WIRE PRECOMPRESSION

John L. Butler, Marshfield; Thomas R. Egan, South Dartmouth, both of Mass.; Kenneth Rodberg, East Providence, R.I., and Arthur E. Clark, Adelphi, Md., assignors to Raytheon Company, Lexington, Mass.

Filed May 18, 1981, Ser. No. 264,518

Int. Cl.³ H04B *17/00*; H04R *17/00*

U.S. Cl. 367—156 **8 Claims**



1. Apparatus for providing compressive stress to a transducer magnetostrictive rod comprising:

a pair of bars;

said rod having its ends in contact with said pair of bars;

means for providing an electrical signal to said magnetostrictive rod;

a pair of wires attached to and between said bars, each wire being attached to said bars on opposite sides of said rod;

means for providing tension in each of said wires;

said bars providing a compressive force on said rod in response to the tension in said wires; and

means for measuring said tension in each of said wires from the resonant frequency of each wire in response to the frequency of said electrical signal.

4,438,510

DISK PLAYER SYSTEM HAVING A DISK SUCKING FUNCTION

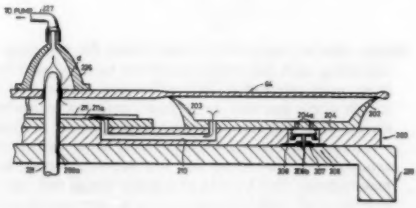
Toyosaku Matsumoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 10, 1981, Ser. No. 301,091

Claims priority, application Japan, Sep. 19, 1980, 55-129183; Sep. 19, 1980, 55-132231[U]; Sep. 19, 1980, 55-132232[U]; Sep. 19, 1980, 55-132233[U]; Sep. 19, 1980, 55-132234[U]; Sep. 19, 1980, 55-132235[U]; Sep. 19, 1980, 55-132236[U]; Oct. 16, 1980, 55-147688[U]; Oct. 16, 1980, 55-147689[U]; Oct. 16, 1980, 55-147690[U]; Oct. 16, 1980, 55-147691[U]; Nov. 19, 1980, 55-165523[U]; Nov. 19, 1980, 55-165524[U]

Int. Cl.³ G11B *17/00, 25/04*

U.S. Cl. 369—271 **23 Claims**



1. A disk player system having a vacuum function comprising:

a turntable;

means for driving said turntable;

a disk vaccuum member located on the turntable of a configuration defining a suction space between said disk vacuum member and a disk when the disk is placed on the turntable;

means provided in said disk vacuum member for defining a suction channel which communicates with said suction space at one end and with the atmosphere about a center spindle of the turntable at the other end;

a check valve provided in said suction channel; and

a vacuum device capable of being detachably connected to said turntable at about said center spindle for reducing pressure in said suction space and thereby causing said disk to be drawn to said disk vacuum member, said vacuum device adapted for disconnection from said turntable when said disk is reporduced.

4,438,511

PACKETIZED ENSEMBLE MODEM

Paul Baran, Menlo Park, Calif., assignor to Telebit Corporation, Cupertino, Calif.

Filed Nov. 10, 1980, Ser. No. 205,744

Int. Cl.³ H04J *11/00, 4/00*

U.S. Cl. 370—19 **10 Claims**

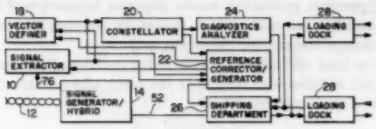
10. In a modem utilized for transmitting source digital information and for receiving destination digital information over a communication medium utilizing a plurality of carriers located within the passband of the communication medium, the improvement comprising:

means for measuring the transmission characteristics of said communication medium constructed from

means for transmitting said source digital information on

selected ones of said carriers at a predetermined amplitude level and for a predetermined period,

means for analyzing signal corruption caused by communication medium impairments to received carriers carrying said destination digital information by comparing received data patterns with known good data patterns, and



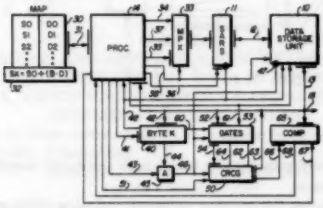
means for avoiding use of at least a selected one of said carriers for transmission of said source digital information in the event said analyzing means indicates said one of said carriers is subject to impairments to said communication medium affecting transmission of data.

4,438,512

METHOD AND APPARATUS FOR VERIFYING STORAGE APPARATUS ADDRESSING

Michael H. Hartung; Richard E. Rieck, and Gerald E. Tayler, all of Pima County, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,414
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—60 **11 Claims**



1. The machine-implemented method of operating a volatile random access data storage unit including a first plurality of addressable data storage registers;

the steps of:

allocating said first plurality of addressable registers into a second plurality smaller than said first plurality of groups of said addressable registers, each group having a given number of said addressable registers;

addressing each of said groups of addressable registers as a single group and accessing individual ones of said addressable registers in said group in a predetermined sequence including all but a last one of said addressable registers that would be next accessed by any reference to said data storage unit;

initializing the signal state of all said last one addressable registers in a given reference state; and

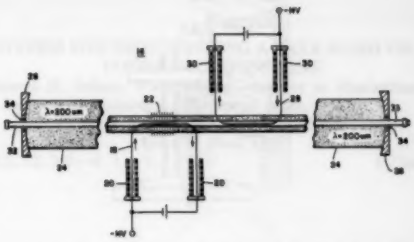
before accessing said addressable registers in said data storage unit, presetting an address for a group to be accessed for enabling said predetermined sequence such that said last one addressable registers are never normally accessed whereby any access to said one addressable registers indicates one error condition.

4,438,513

SHORT WAVELENGTH FREE ELECTRON LASER USING LOW ENERGY ELECTRONS

Luis R. Elias, Goleta; John M. J. Madey, and Todd I. Smith, both of Palo Alto, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1981, Ser. No. 228,649
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—2 **4 Claims**



1. A continously tunable apparatus for the production of intense coherent optical radiation comprising:

(a) a laser cavity resonator, said resonator having a longitudinal optical axis and two opposed mirrors aligned at opposite ends of said axis to reflect radiation generated in said resonator;

(b) means for producing a first DC velocity modulated electron beam and directing said first electron beam along said axis of said resonator;

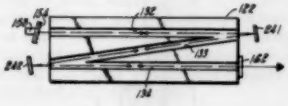
(c) means for establishing a static periodic magnetic field uniformly transverse to and symmetric about a portion of said axis of said cavity resonator and through which said first DC velocity modulated electron beam passes, said first DC velocity modulated electron beam and said static periodic magnetic field interacting to produce a tunable intense continuous electromagnetic pump field oscillating between said mirrors and along said optical axis of said cavity.

4,438,514

SURE-START WAVEGUIDE LASER

Peter P. Chenausky, Avon; Leon A. Newman, South Windsor, and Erroll H. Drinkwater, Portland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 16, 1982, Ser. No. 349,236
Int. Cl.³ H01S *3/03*
U.S. Cl. 372—64 **4 Claims**



1. In an RF discharge waveguide laser including first and second RF electrodes;

an insulating plate disposed between said first and second electrodes;

a plurality of optical waveguides formed in said plate;

means for resonating optical radiation within said plurality of optical waveguides;

the improvement comprising:

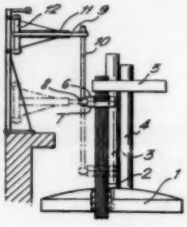
at least one coupling channel formed in said plate, said at least one coupling channel communicating between at least two of said plurality of optical waveguides.

4,438,515

PROTECTION OF GRAPHITE ELECTRODES

Dietger Dunkelmann, Bocholt; Helmut Jaunich, Raesfeld, and Josef Schiffarth, Bocholt-Barlo, all of Fed. Rep. of Germany, assignors to Foseco Trading A.G., Chur, Switzerland

Filed Jun. 28, 1982, Ser. No. 392,463
Claims priority, application United Kingdom, Jun. 26, 1981, 8119714
Int. Cl.³ H05B 7/06
U.S. Cl. 373—88 9 Claims



1. A method of treating the surface of a hot graphite electrode to provide a protective coating thereon comprising the steps of:

(a) disposing the electrode along an axis;

(b) advancing at least one generally arcuate spray unit towards a side of the electrode to a spraying position adjacent a side of the electrode where the centre of the arc is generally coincident with the axis of the electrode; and

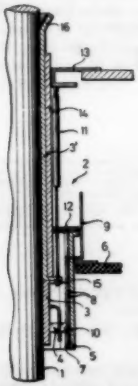
(c) from the spraying position of the unit, spraying matter comprising a graphite-wetting fusible matrix material and a refractory material from said at least one spray unit generally towards the centre of the arc to provide a protective coating on the adjacent side of the electrode.

4,438,516

MEANS FOR AN ELECTROTHERMAL SMELTING FURNACE

Harald Krogsrud, Gjettum, Norway, assignor to Elkem a/s, Oslo, Norway

Filed Jul. 9, 1981, Ser. No. 281,688
Claims priority, application Norway, Jul. 25, 1980, 802265
Int. Cl.³ H05B 7/107
U.S. Cl. 373—97 13 Claims



1. A holder assembly for self-baking electrodes of an electrothermal smelting furnace, said electrode hving a baking zone for baking unbaked electrode paste introduced above the baking zone, comprising:

(a) a plurality of contact clamps comprising upper and lower portions, said contact clamps extending upwardly at least to a level above said baking zone where the unbaked electrode paste is not affected by heat from the furnace;

(b) a surrounding cylindrical body arranged externally about said upper portion of said contact clamps;

(c) a thrust member arranged externally about said lower portion of said contact clamps;

(d) pressure producing means disposed between said thrust member and said contact clamps for pressing said contact clamps toward the electrode; and

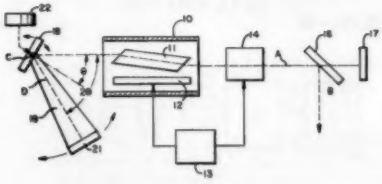
(e) at least one contact clamp being individually suspended and slidable with respect to the other said contact clamps and said cylindrical body.

4,438,517

INTERFEROMETRICALLY TUNED LASER RESONATOR

Lloyd C. Bobb, Willow Grove; Michael Rankin, Hatboro, and Gerald D. Ferguson, Yardley, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 28, 1980, Ser. No. 210,902
Int. Cl.³ H01S 3/08
U.S. Cl. 372—99 11 Claims



1. An interferometrically tuned laser resonator comprising, in combination:

optical means for emitting polarized radiation of fluorescent lines of a first polarity in opposite directions along a first optical axis when energized by a first signal;

switching means positioned to pass the radiation in one of the directions and for changing the first polarity to a second polarity when energized by a second signal;

first reflector means positioned to receive the radiation from said switching means for passing the radiation of the first polarity along the first optical axis, and for reflecting the radiation of the second polarity as a useful output along a second optical axis angularly displaced from the first optical axis;

second reflector means positioned to receive the radiation from said first reflector means for reflecting the radiation back along said first optical axis;

third reflector means positioned to receive the radiation in the other of the directions for interferometrically reflecting selected ones of the fluorescence lines back along the first optical axis; and

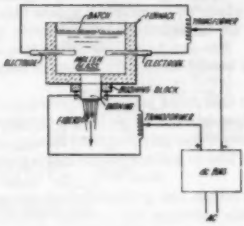
controller means connected to said optical means and said switching means for providing said first and second signals in timed sequence, the elapsed time between the first and second signals being sufficient for the radiation of the first polarity to reach a useful output level.

4,438,518

METHOD FOR PROTECTING FORMING BUSHINGS

David J. Gaul; Jay W. Hinze, and Richard A. Perkins, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 6, 1982, Ser. No. 405,850
Int. Cl.³ C03B 5/02
U.S. Cl. 373—39 8 Claims



1. A process for forming molten glass in a melting furnace containing a body of electrically conductive molten glass having bushings made of a refractory or nobel metal and a bushing firing circuit, and having electrodes made of a dissimilar metal and an electrode firing circuit,

applying electrical current to the bushing firing circuit to cause heating of the bushings by resistive heating,

applying electrical current to the electrode firing circuit to cause electrical current to flow between the electrodes through the molten material to cause heating of the molten material by Joule effect and,

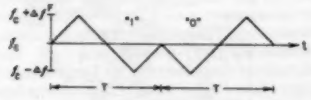
simultaneously applying a positive or anodic direct current bias to the bushings, including the step of biasing the bushing firing circuit with the electrode firing circuit, to protect the bushings from cracking.

4,438,519

METHODS, AND APPARATUS, FOR TRANSMITTING HIGH-BIT-RATE DIGITAL DATA IN POWER LINE COMMUNICATION MEDIA HAVING HIGH HARMONIC NOISE CONTENT

Sanjay K. Bose, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 4, 1981, Ser. No. 260,432
Int. Cl.³ H04L 27/10
U.S. Cl. 375—1 39 Claims



1. A method for transmitting binary data, comprising the steps of:

(a) providing a variable-frequency transmitter having a predetermined center frequency;

(b) selecting a bit time interval in which a bit of said binary data is to be transmitted;

(c) causing the transmitter instantaneous frequency to be at the center frequency at the beginning and end of each bit time interval;

(d) continuously varying without discontinuity the instantaneous transmitting frequency at least once during a bit time interval to a maximum frequency greater than the center frequency and then to a minimum frequency less than the center frequency, with the maximum frequency and the minimum frequency respectively occurring at one-quarter and three-quarters of the bit time interval, to transmit a first binary condition; and

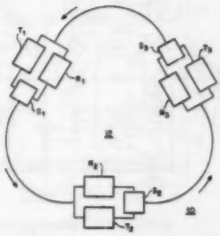
(e) continuously varying without discontinuity the instantaneous transmitter frequency at least once during a bit time interval to a minimum frequency less than the center frequency and then to a maximum frequency greater than the center frequency, with the minimum frequency and maximum frequency respectively occurring at one-quarter and three-quarters of the bit time interval, to transmit a second binary condition.

4,438,520

SYSTEM FOR REGENERATING A DATA WORD ON A COMMUNICATIONS RING

Jerome H. Saltzer, Waban, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 22, 1981, Ser. No. 285,800
Int. Cl.³ H04J 6/02
U.S. Cl. 375—4 5 Claims



1. A system for regenerating a n-bit data word on a communications ring signal path, said system having a nominal system clock rate, comprising:

A. means for receiving said n-bit data word and generating an n-cycle derived clock signal and an n-bit derived data word from said received data word,

B. means for generating a local data word from said derived data word, said local data word corresponding to said derived data word delayed by i periods, each of said periods being approximately equal to the period associated with the nominal system clock rate,

C. means for generating an n-cycle transmit clock signal from said derived clock signal, said transmit clock signal including $n-i$ cycles at the same rate as the $(i+1)^{th}$ through the n^{th} cycles of said derived clock signal followed by i cycles at said system clock rate, where i is greater than or equal to one, and less than or equal to $n-1$,

D. means for generating an n-bit transmit data word from said transmit clock signal and said local data word, each bit corresponding in time to a correspondingly positioned cycle of said transmit clock signal and having a bit value corresponding to the correspondingly positioned bit value of said local data word, wherein said transmit data word is said reclocked n-bit data word.

4,438,521

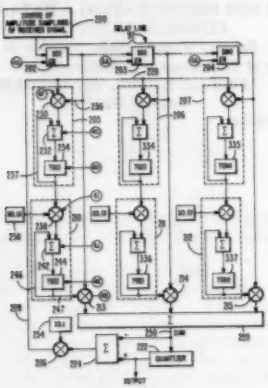
AUTOMATICALLY ADAPTIVE TRANSVERSAL FILTER

Anthony Mattei, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,920
Int. Cl.³ H04B 3/18
U.S. Cl. 375—16 7 Claims

5. In an adaptive equalizer for equalizing distortion in a received signal and comprising N-stage delay line means, and first means for sampling said received signal to provide samples and for serially entering said samples into said delay line means, and first logic means responsive to the samples con-

tained in said delay line stages to generate a scaled error signal and comprising N second logic means each responsive to the sample in an associated one of said N delay line stages and to said scaled error signal to produce a weighted sample, said first logic means further comprising summing means for summing all of said weighted samples after each entry of a new sample into said delay line means, decision making means responsive to each of the sums from said summing means to output a selected quantized output signal, and second means for determining and scaling the difference between said first and quantized output signals to produce said scaled error signal, and in which said second logic means comprises:



first multiplier means for multiplying the sample in an associated delay line stage by said scaled error signal to produce a first scaled output signal;

accumulating means for accumulating the values of successive blocks of M first scaled output signals;

third means for scaling said accumulated first scaled output signals;

second accumulating means for accumulating said scaled accumulated first scaled output signals at every Mth sample to produce a weighting tap signal; and

second multiplying means for multiplying said weighting tap signal by the value of the sample in the associated delay line stage to produce said weighted sample.

4,438,522

METHOD FOR ENCODING ANALOG SIGNALS USING PCM DIFFERENCE CODE WORD FOR FORMING A CODE WORD OF SPECIFIED LENGTH

Bjoern Bluethgen, Celle, Fed. Rep. of Germany, assignor to Polygram GmbH, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 189,595

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1979, 2941452

Int. Cl.³ H03K *13/22*

U.S. Cl. 375—27 **10 Claims**

1. A method for encoding analog signals for storage and transmission thereof in digital form for reducing the digital signal flow comprising the steps of:

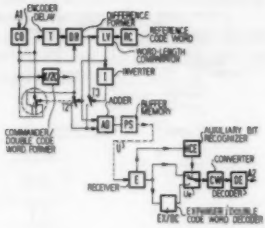
sampling momentary values of said analog signal;

converting the sampled momentary values of said analog signal into a series of pulse code modulated code words;

forming a corresponding series of pulse code modulated difference code words from pairs of successive pulse code modulated code word in said series, the length of each pulse code modulated difference code word together with one auxiliary code element indicating polarity forming a reference code word having a predetermined constant length which is selected to be less than a maximum possible length of a pulse code modulated difference code word;

constantly comparing the respective lengths of the combination of said pulse code modulated difference code word and said auxiliary code element with the length of said reference code word;

abbreviating a pulse code modulated difference code word



compared with said reference code word when the length of said combination exceeds the length of said reference code word, such that said combination is abbreviated to less than or equal to said reference code word length; and

adding a second auxiliary code element indicating code form to the abbreviated code word and to the length of said reference code word as required for identifying one of two alternative types of code form.

4,438,523

DIFFERENTIAL DIGITAL MODULATION AND DEMODULATION SYSTEM WITH AN ANALOG SIGNAL-DEPENDENT SAMPLING CLOCK

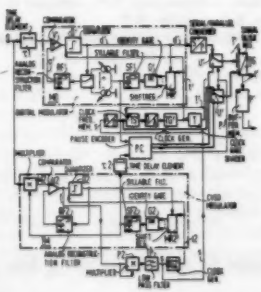
Hans Brandl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,794

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044765

Int. Cl.³ H04B *12/04*

U.S. Cl. 375—30 **18 Claims**



1. A differential digital modulation and demodulation system comprising:

a means for analog to digital conversion of an analog input signal including

a first digital modulator to which said analog input signal is supplied for converting said analog signal into a digital signal to be transmitted,

a sampling clock for controlling said first digital modulator, said sampling clock having and being controlled by a sampling clock generator,

a second digital modulator to which said analog input signal is supplied for generating a tracking error signal,

a means for generating a control signal for said sampling clock generator from said tracking error signal of said second digital modulator, said control signal increasing the frequency of said sampling clock generator upon an increasing tracking error signal and reducing the frequency of said sampling clock generator upon a decreasing tracking error signal;

a means connected to an output of said first digital modulator and to said sampling clock for generating a signal block containing a plurality of digital signal bits corresponding to said analog signal and a bit group identifying the sampling clock frequency employed for generating said digital signal bits in encoded form; and

a means for digital to analog conversion of said signal block including

a means for separating said signal block into components consisting of said digital signal bits and said bit group,

a digital demodulator for converting said digital signal bits into an analog signal corresponding to said analog input signal,

a clock generator for controlling said digital modulator,

a clock frequency memory for receiving said bit group and for controlling said clock generator such that said clock generator supplies a frequency for controlling said digital demodulator which corresponds to the frequency in said means for analog to digital conversion which was employed for generating said digital signal bits.

4,438,524

RECEIVER FOR ANGLE-MODULATED CARRIER SIGNALS

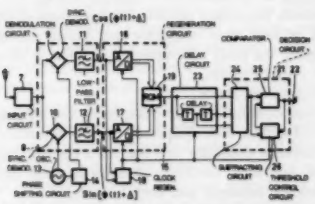
Dirk Muilwijk, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1982, Ser. No. 375,597

Claims priority, application Netherlands, May 27, 1981, 8102595

Int. Cl.³ H04L *27/18*

U.S. Cl. 375—80 **3 Claims**



1. A receiver for angle-modulated carrier signals, the receiver comprising an input circuit for deriving the transmitted angle-modulated carrier signal from a transmission channel, a reference carrier circuit, a demodulation circuit coupled to the input circuit for demodulating the transmitted angle-modulated carrier signal with the reference carriers for generating first and second demodulated signals, and a regeneration circuit for determining the instantaneous phase from said first and second demodulated signals, the receiver further comprising a decision circuit for producing regenerated binary data signals from the instantaneous phase, characterized in that the reference carrier circuit in the receiver comprises a carrier oscillator, the frequency of which is approximately equal to the frequency of the carrier oscillator of the transmitter, that the decision circuit in the receiver determines the phase difference between the end of a period, which is two symbol intervals long and has a length of 2T, and the beginning of a second period, which is two symbol intervals long and has a length 2T, that the decision circuit is arranged for generating a first logic value if the phase difference exceeds a decision threshold and for generating a second logic valve if the phase difference falls short of said decision threshold, that the decision threshold for a second dibit interval, which has a length of two symbol intervals and follows after a present dibit interval having a length of two symbol intervals, and beginning midway said present dibit interval, is equal to $(\pi/2)$ rad. if the first logic value is regenerated in the present dibit interval, that the decision threshold for the second dibit interval is equal to $(\pi/4)$ rad. if the second logic value was generated in the present dibit interval and, in a preceding dibit interval in which the first logic value was generated, the phase difference was positive (negative) and the number of symbol intervals between said preceding dibit interval and the present dibit interval is even (odd), and that the decision threshold for the second dibit internal is $-(\pi/4)$ rad, for the remaining cases in which the phase difference was negative and the number of symbol intervals is even, or vice versa.

4,438,525

REVERBERATION APPARATUS

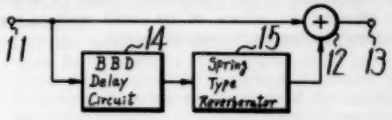
Takashi Shibata, Kamakura, and Masaaki Nishimura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,557

Claims priority, application Japan, Dec. 23, 1980, 55-185939[U]

Int. Cl.³ G10H *1/02*

U.S. Cl. 381—63 **8 Claims**



1. A reverberation apparatus, comprising:

a signal input terminal to be supplied with an input signal;

delay circuit means having input and output terminals;

said delay circuit means input terminal being connected to said signal input terminal;

a spring type reverberator having input and output terminals, the input terminal of which is connected to the output terminal of said delay circuit means;

summing means having a pair of input terminals and output terminal, the pair of input terminals being respectively connected to said signal input terminal and the output terminal of said spring type reverberator, and the output terminal of said summing means having a desired reverberation sound produced thereat; and

said delay circuit means producing a delay time such that a relatively high level spring type reverberation sound signal produced by the spring type reverberator appears at the output terminal after said delay time relative to application of the input signal.

4,438,526

AUTOMATIC VOLUME AND FREQUENCY CONTROLLED SOUND MASKING SYSTEM

Richard O. Thomalla, St. Paul, Minn., assignor to Cowed Corporation, St. Paul, Minn.

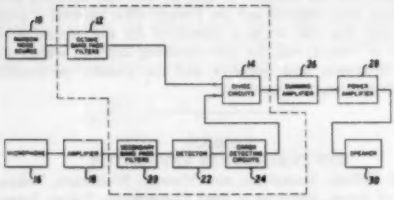
Filed Apr. 26, 1982, Ser. No. 372,033

Int. Cl.³ G10K *11/00*

U.S. Cl. 381—73 **10 Claims**

2. A sound masking system comprising means for generating a random noise spectrum; a plurality of primary filters for separating the random noise spectrum into signal components of predetermined frequencies; a plurality of divide circuits, each said divide circuit being operative for receiving an associated signal component from among said signal components at a divide input port thereof; amplification means, said amplification means receiving an output from said divide circuits for driving a sound generating means in correspondence with said output; at least one microphone for sensing sounds in the ambient sound environment and providing an electronic signal in

correspondence therewith; an input amplifier for amplifying said electronic signal; a plurality of secondary filters for receiving the amplified electronic signal and separating said electronic signal into predetermined frequency components thereof; said secondary filter providing input signals to a plurality of electronic detector circuits; said plurality of error-detecting circuits operative for receiving signals from said



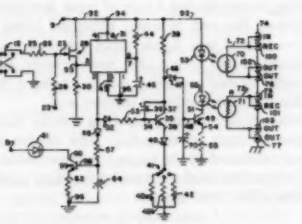
electronic detector circuits and feeding an error signal in correspondence with the output of said detector circuits to the denominator input ports of said plurality of divide circuits, whereby said divide circuits vary the output amplitude of said signal components to said amplification means for automatically adjusting the volume of the sound masking system throughout the frequency spectrum thereof.

4,438,527

SIGNAL RESPONSIVE AUTOMATIC CONTROL FOR AUDIO EQUIPMENT

William P. Hammond, 7472 Delmar, St. Louis, Mo. 63130

Filed Apr. 2, 1982, Ser. No. 365,084
Int. Cl.³ H04M *11/00*; H03G *3/20*
U.S. Cl. 381—107 **13 Claims**



1. A device for automatically muting an audio signal, comprising:

means for providing an electrical signal having at least first and second voltage levels;

means for sensing said first and said second voltage signal levels;

means operatively connectable to an audio amplifier for providing distortion free attenuation control of the audio output of said amplifier;

means operatively connected to said first and second voltage sensing means for predeterminedly operating said control means, said operating means automatically providing at least first and second attenuation control voltage signal levels in response respectively to said first and second voltage signals levels; and

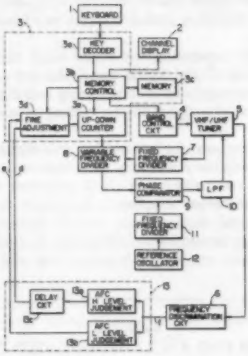
means for adjusting at least one of said first and second attenuation control voltage signal levels operatively connected to said predeterminedly operating means.

4,438,528

CHANNEL SELECTION SYSTEM FOR AN ELECTRONIC TUNER

Tsuguo Itagaki, Kamakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,649
Claims priority, application Japan, Aug. 6, 1981, 56-122497
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—182 **3 Claims**



1. A channel selection system comprising:

(a) a tuner having a local oscillator and a mixer for mixing the output of said local oscillator and a received signal and generating an intermediate frequency signal,

(b) a variable frequency divider for frequency-dividing the output of said local oscillator and either increasing or decreasing the ratio of frequency division in accordance with a control signal,

(c) a reference oscillator,

(d) a phase comparator for comparing the phases of the output of said variable frequency divider and the output of said reference oscillator and feeding a comparison output back to said local oscillator thereby to keep phase synchronization between said both outputs,

(e) a frequency discriminator for receiving said intermediate frequency signal and generating a discrimination signal corresponding to a difference between the frequency of said intermediate frequency signal and a reference frequency,

(f) a first control circuit for supplying to said variable frequency divider a first control signal for either increasing or decreasing the frequency division ratio of said variable frequency divider so that said discrimination signal approaches its center value when said discrimination signal is larger than a first prescribed value,

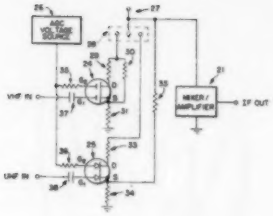
(g) a second control circuit for supplying to said variable frequency divider a second control signal for causing a variation of the frequency division ratio opposite to the variation given by said first control signal when said discrimination signal is less than a second prescribed value, and

(h) a delay circuit provided between at least one of said first and second control circuits and said variable frequency divider and for causing a delay at the rise time of at least one of said first and second control signals while causing no delay at the falling time of said at least one control signal signal.

4,438,529
TV TUNER CIRCUIT

Takeshi Sato, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 7, 1982, Ser. No. 337,857
Claims priority, application Japan, Jan. 8, 1981, 56-1719
Int. Cl.³ H04B 1/16
U.S. Cl. 455—190 1 Claim

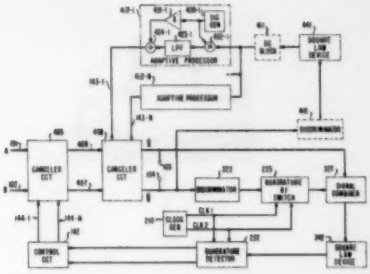


1. A TV tuner circuit comprising: a VHF RF amplifier having a MOS FET with first and second gates, a source and a drain, said first gate thereof being coupled to a VHF signal input terminal; a UHF RF amplifier having a MES FET with first and second gates, a source and a drain, said first gate thereof being coupled to a UHF signal input terminal; a switch means having a common terminal, a first terminal for selecting VHF signal receiving and a second terminal for selecting UHF signal receiving; a mixer for converting either VHF RF signal or UHF RF signal into an IF signal; an AGC voltage source coupled to said respective second gates of said MOS FET and said MES FET through resistors; a DC source voltage input terminal connected to said common terminal of said switch means and to an input terminal of said mixer; and an IF signal output terminal connected to an output terminal of said mixer; wherein said source and drain of said MOS FET are connected to said first terminal of said switch means through resistors, and said drain of said MES FET is connected to said second terminal of said switch means; and wherein said respective sources of said MOS FET and said MES FET and connected to ground through resistors, and said source of said MES FET is connected to said DC source voltage input terminal through a resistor.

4,438,530
ADAPTIVE CROSS-POLARIZATION INTERFERENCE CANCELLATION SYSTEM

Michael L. Steinberger, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 14, 1982, Ser. No. 388,032
Int. Cl.³ H04B 1/10
U.S. Cl. 455—278 8 Claims



1. An adaptive interference cancellation arrangement of the type including

cancellation means responsive to at least one first control signal for translating a first corrupted signal into a first output signal substantially comprised of a desired signal component of the first corrupted signal, the cancellation means also responsive to at least one second control signal for translating a second corrupted signal into a second output signal substantially comprised of a desired signal component of the second corrupted signal,

correlation means jointly responsive to the first and second output signals for combining the first and second output signals to generate both a first correlation signal and a second correlation signal, and

control means for adjusting at least one predetermined characterstic of first correlation signal to generate at least one first control signal and for adjusting at least one predetermined characteristic of the second correlation signal to generate at least one second control signal,

the arrangement characterized in that the combining means includes

oscillator means for generating first and second clock signals in an orthogonal relationship with each other,

switching means for periodically adjusting the phase of the first output signal in response to the first and second clock signals to generate a plurality of phase adjusted components of the first signal as a first multiplexed signal,

means for combining the second output signal with the first multiplexed signal to generate a third output signal,

a square law device for detecting the power in the third output signal to generate an output signal representing the power envelope of the third output signal, and

a quadrature detector coupled to the square law device and responsive to the first and second clock signals for generating the second correlation signal.

273,054

HUNTING GLOVE

James Brinson, Jr., Augusta, Ga., assignor to Geneva L. Brinson, Augusta, Ga.

Filed Apr. 30, 1981, Ser. No. 187,426

U.S. Cl. D2—376

273,055

SIMULATIVE UMBRELLA

Spencer Lee, 5517 Robertson Ave., Sacramento, Calif. 05821

Filed Oct. 19, 1981, Ser. No. 312,380

U.S. Cl. D3—6

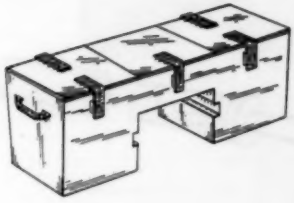
273,056

BOAT SEAT BOX CONSOLE OR SIMILAR ARTICLE

Richard C. Lennon, 1018-28th St., Sioux City, Iowa 51104

Filed Dec. 19, 1980, Ser. No. 218,219

U.S. Cl. D3—40



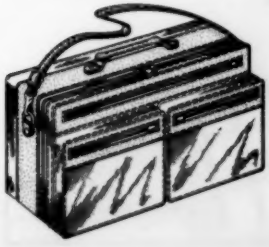
273,057

LUGGAGE DESIGN

Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.

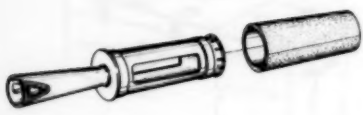
Filed Feb. 12, 1982, Ser. No. 348,489

U.S. Cl. D3—71

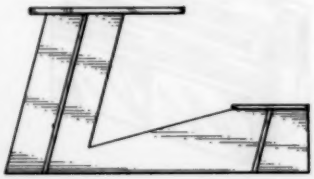


273,058
LINT REMOVER
Nicholas D. McKay, Grand Blanc, Mich., assignor to Helmac Products Corporation, Flint, Mich.
Filed Aug. 6, 1981, Ser. No. 290,723
U.S. Cl. D4—23.1

273,059
LINT REMOVER
Nicholas D. McKay, Grand Blanc, Mich., assignor to Helmac Products Corporation, Flint, Mich.
Filed Aug. 6, 1981, Ser. No. 290,725
U.S. Cl. D4—23.1

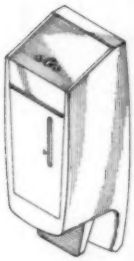


273,060
COMBINED DESK AND SEAT UNIT
John H. Martin, Carlisle Castle 207, 1850 Palm City Rd., Stuart, Fla. 33494
Filed Dec. 10, 1981, Ser. No. 329,544
U.S. Cl. D6—6



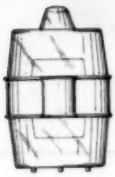
273,061
ROCKING CHAIR
Aldwin K. Goff, Rte. 2, Box 31-O, Ochlochnee, Ga. 31773
Filed Dec. 17, 1981, Ser. No. 331,637
U.S. Cl. D6—49

273,062
SOAP DISPENSER
James E. Richardson, Westport, Conn., assignor to Waterbury Companies, Inc., Waterbury, Conn.
Filed Jul. 20, 1981, Ser. No. 284,665
U.S. Cl. D6—95

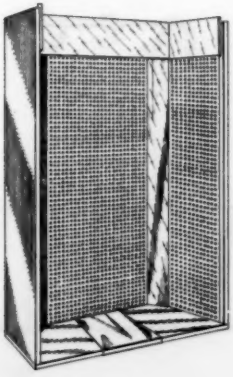


273,063
SHEET MATERIAL DISPENSER
Douglas K. Gatward, 1212, Great Cambridge Rd., Enfield, Middlesex, England
Filed Feb. 10, 1981, Ser. No. 233,142
Claims priority, application United Kingdom, Aug. 20, 1980, 996212
U.S. Cl. D6—96

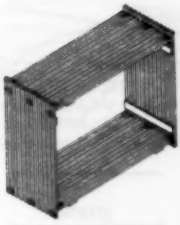
273,064
TOWEL DISPENSER
Henry Minost, Paris, France, assignor to BEGHIN-SAY S.A., Thumeries, France
Filed Aug. 27, 1931, Ser. No. 297,041
Claims priority, application France, Feb. 27, 1981, 81.0717
U.S. Cl. D6—96



273,065
DISPLAY BOOTH
Rafael T. Bustos, Atlanta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Jul. 2, 1980, Ser. No. 165,363
U.S. Cl. D6—132



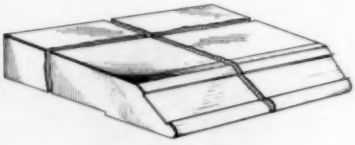
273,066
TABLE OR SIMILAR ARTICLE
Edward H. Kneale, III, 335 Pleasant Pines Ave., Centerville, Mass. 02632
Filed Jan. 19, 1981, Ser. No. 226,482
U.S. Cl. D6—179



273,067
SHELF UNIT
James G. Evans, 17999 North St., Vandalia, Mich. 49095
Filed Oct. 2, 1981, Ser. No. 308,069
U.S. Cl. D6—186

273,068
DISPENSER FOR CANS OR BOTTLES
William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Aug. 27, 1981, Ser. No. 296,997
U.S. Cl. D6—188

273,069
FURNITURE TOP
Jon A. Yauger, Fairfield, Ohio, assignor to Hamilton Sorter Co., Inc., Fairfield, Ohio
Filed Jul. 18, 1980, Ser. No. 170,054
U.S. Cl. D6—192



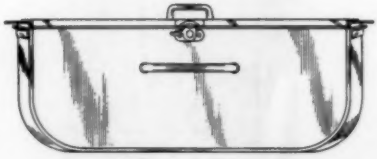
273,070
WORK TABLE TOP
John H. Welsch, Moscow, and Rodney Brancher, Wilkes-Barre, both of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.
Filed Dec. 23, 1981, Ser. No. 333,994
U.S. Cl. D6—192

273,071
PILLOW
Lucille Stark, Pine Village II, Box 127, Hobart, Ind. 46342
Filed Nov. 17, 1981, Ser. No. 322,219
U.S. Cl. D6—201

273,072
SLEEPWEAR HANGER
John H. Batts, East Grand Rapids, and Everett L. Duester, Zeeland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.
Filed Mar. 15, 1982, Ser. No. 357,845
U.S. Cl. D6—254

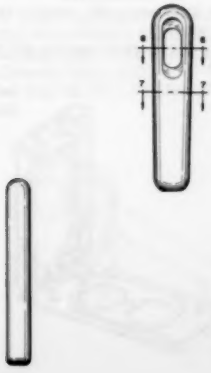
273,073
SLEEPWEAR HANGER
John H. Batts, East Grand Rapids, and Everett L. Duester, Zeeland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.
Filed Mar. 15, 1982, Ser. No. 357,851
U.S. Cl. D6—254

273,074
REMOVABLE CANOE-CARRIED COOLER
Kenneth G. Mathieu, 33980 Oakdale, Livonia, Mich. 48154
Filed Sep. 21, 1981, Ser. No. 304,119
U.S. Cl. D7—77



273,075
TURNING UTENSIL FOR BARBECUES
Shawn A. Hayden, 22 Stadium Rd., Methuen, Mass. 01844
Filed Oct. 15, 1981, Ser. No. 311,549
U.S. Cl. D7—106

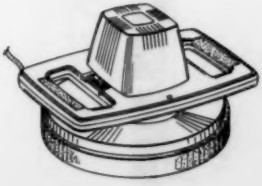
273,076
HANDLE FOR A KITCHEN TOOL
Nigel F. Bodfish, Solihull, England, assignor to Gill-Mentor Limited, Great Britain
Filed Jul. 31, 1981, Ser. No. 291,731
Claims priority, application United Kingdom, Feb. 3, 1981, 998728
U.S. Cl. D7—395



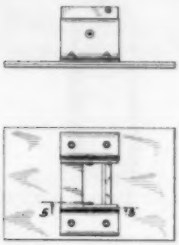
273,077
DETENT COUPLED DRILL BIT CHUCK OR THE LIKE
Melvin C. Bell, 10614 Sheldon Woods Way, Elk Grove, Calif. 95624
Filed May 11, 1981, Ser. No. 262,340
U.S. Cl. D8—10

273,078
HEAD FOR A TOOL FOR APPLYING AND REMOVING CYCLE TIRES
Stig B. Börebäck, Lyngby 12, S-240 13 Genarp, Sweden
Filed Aug. 31, 1981, Ser. No. 297,601
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, URA 289/81
U.S. Cl. D8—31

273,079
BUFFER
Howard Ibaraki, Hacienda Heights, Calif., assignor to Orion Industries, Inc., Compton, Calif.
Filed Nov. 16, 1981, Ser. No. 321,932
U.S. Cl. D8—62



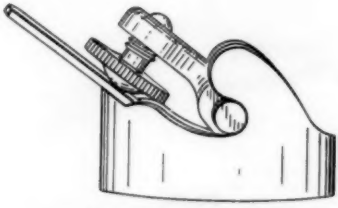
273,080
TURNING BLOCK FOR GLASS PANELS OR THE LIKE
Benjamin C. Bradberry, 4615 Early Rise La., Jacksonville, Fla. 32223
Filed Mar. 25, 1981, Ser. No. 247,235
U.S. Cl. D8—71



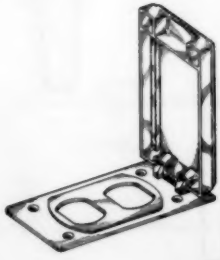
273,081
SHARPENING STONE HOLDER FOR KNIFE SHARPENER
Arthur L. Levine, P.O. Box 800, Williamsville, N.Y. 14221
Filed Nov. 30, 1981, Ser. No. 325,759
U.S. Cl. D8—93

273,082
GLASS CUTTER
Mellen-Thomas Benedict, 4760 Yadkin Rd., Fayetteville, N.C. 28303
Filed Dec. 24, 1981, Ser. No. 334,366
U.S. Cl. D8—98

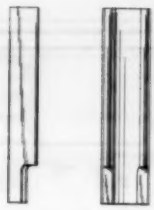
273,083
WOOD WORKING PLANE
Irving Sloane, 42, Square Marguerite, Box 73, 1040 Brussels, Belgium
Filed Dec. 21, 1981, Ser. No. 333,431
Claims priority, application United Kingdom, Jun. 19, 1981, 81/1001089
U.S. Cl. D8—101



273,084
ELECTRICAL OUTLET COVER PLATE AND CLOSURE THEREFOR
Daniel P. Henkel, Kunkletown, Pa., assignor to Square D Company, Palatine, Ill.
Filed Oct. 1, 1981, Ser. No. 307,407
U.S. Cl. D8—353

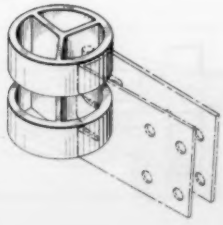


273,085
SPACER FOR FERTILIZER TUBING
Halsey J. Wetmore, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc., Guymon, Okla.
Filed Mar. 16, 1981, Ser. No. 244,041
U.S. Cl. D8—354

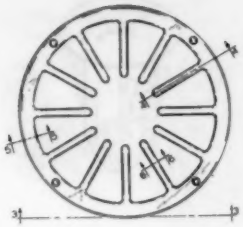


273,086
UNITARY WATER SKI ROPE HANDLE AND REEL
Neil F. Coleman, 2225 9th St. SE., Winter Haven, Fla. 33880
Filed Aug. 24, 1981, Ser. No. 295,563
U.S. Cl. D8—358

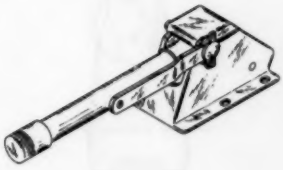
273,087
GEODESIC DOME CONNECTOR
Janet B. Johnson, and Dennis O. Johnson, both of Rte. 3, Box 105D, North Branch, Minn. 55056
Filed Aug. 14, 1981, Ser. No. 292,952
U.S. Cl. D8—382



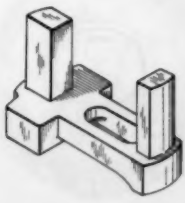
273,088
VEGETABLE HOLDER
Franklin R. Anderson, Durham, N.C., assignor to Custom Molders, Inc., Durham, N.C.
Filed Nov. 13, 1981, Ser. No. 321,082
U.S. Cl. D8—395



273,089
LOUVRE OPENER
Albert Cole, Keswick, England, assignor to Thermoforce Limited, Cumbria, England
Filed Sep. 15, 1981, Ser. No. 302,604
Claims priority, application United Kingdom, Apr. 3, 1981, 81/999793
U.S. Cl. D8—400



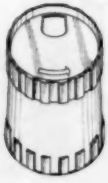
273,090
THRESHOLD SEAL FOR A DOOR ASTRAGAL
Raymond E. Imperial, P.O. Box 368, Richmond, Ind. 47374
Filed Nov. 6, 1981, Ser. No. 318,734
U.S. Cl. D8—400



273,091
HOLE PLUG OR THE LIKE
Mutsuo Kurosaki, Kyoto, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Dec. 23, 1981, Ser. No. 334,027
Claims priority, application Japan, Jul. 7, 1981, 56-29471
U.S. Cl. D8—499

273,092
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 20, 1981, Ser. No. 294,610
U.S. Cl. D9—389

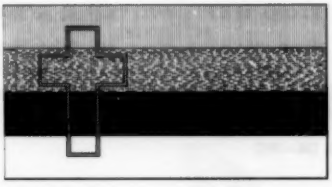
273,093
PILL DISPENSER
Hans-Göran Lunden, and Nils-Ake W. Ternerot, both of Södertälje, Sweden, assignors to Astra-Syntex Scandinavia Aktiebolag, Södertälje, Sweden
Filed Sep. 16, 1981, Ser. No. 302,548
Claims priority, application Sweden, Mar. 19, 1981, 81-693
U.S. Cl. D9—389

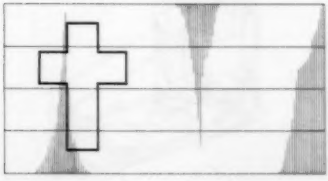


273,094
STENOGRAPHIC RULER
Mery Clausen, P.O. Box 5173, Stanford, Calif. 94305, and William K. Szaroletta, San Jose, Calif., assignors to Mery Clausen, Stanford, Conn.
Filed Aug. 17, 1981, Ser. No. 293,915
U.S. Cl. D10—71

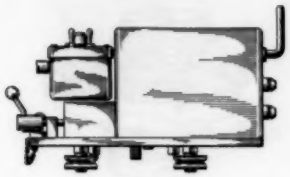
273,095
VISUAL MARKER
Herbert C. Schulze, P.O. Box 6070, Incline Village, Nev. 89450
Filed Feb. 23, 1981, Ser. No. 237,245
U.S. Cl. D10—109

273,096
FLAG
Peggy L. Cooper Inks, Rte. 9, Box 222, London, Ky. 40741
Filed Feb. 21, 1978, Ser. No. 879,819
U.S. Cl. D11—175

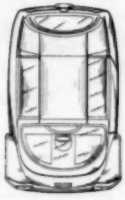




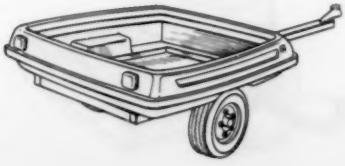
273,097
ALL POSITION TRACTOR FOR MOUNTING A TOOL SUCH AS A WELDING, CUTTING OR GOUGING TORCH
David E. Johnson, Pataskala; Kenneth E. McCall, and William J. Coughlin, both of Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Jun. 16, 1981, Ser. No. 274,090
U.S. Cl. D12—36



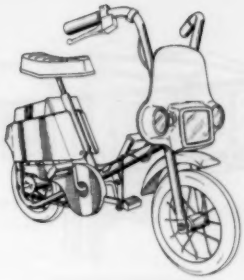
273,098
AUTOMOBILE
Teruhiko Ohhashi, Hamamatsu, Japan, assignor to Suzuki Motor Co. Ltd., Kamimura, Japan
Filed Apr. 1, 1981, Ser. No. 249,829
U.S. Cl. D12—90



273,099
TRAILER
Kevin E. Koch, 47 Kinkaid Ave., North Plympton, State of South Australia, Australia
Filed Mar. 17, 1981, Ser. No. 244,641
U.S. Cl. D12—105

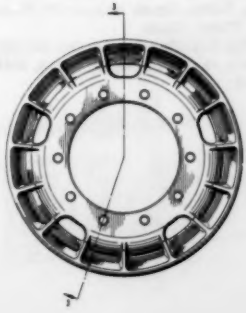


273,100
POWER ASSISTED BICYCLE
William H. Ziegler, Bedford, Pa., assignor to Brown Group Recreational Products, Inc., Bedford, Pa.
Filed Jul. 10, 1981, Ser. No. 282,097
U.S. Cl. D12—111

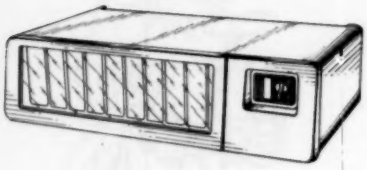


273,101
MOTORCYCLE CRUISE CONTROL
Cecil M. Kiser, Jr., 304 N. Main, Newkirk, Okla. 74647
Division of Ser. No. 8,978, Feb. 2, 1979, Pat. No. D. 267,085.
This application Oct. 16, 1981, Ser. No. 311,992
U.S. Cl. D12—174

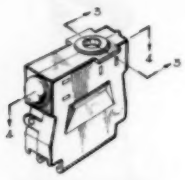
273,102
WHEEL
Richard R. Woodward, Yalding, England, assignor to GKN Kent Alloys Limited, England
Filed Sep. 8, 1981, Ser. No. 300,162
Claims priority, application United Kingdom, Apr. 7, 1981, 81 999832
U.S. Cl. D12—209



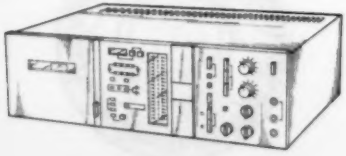
273,103
FLUID MATERIAL APPLICATION CONTROLLER
Richard R. Lewellen, Wooster, Ohio, assignor to Nordson Corporation, Amherst, Ohio
Filed Sep. 14, 1981, Ser. No. 301,521
U.S. Cl. D13—12



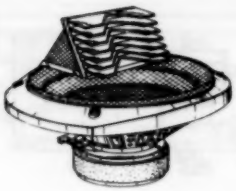
273,104
ELECTRICAL PLUG OR SOCKET COVER
George Cousins, Lower Sackville, Canada, assignor to Cabco Research Ltd., Nova Scotia, Canada
Filed Jun. 15, 1981, Ser. No. 273,286
Claims priority, application Canada, Apr. 7, 1981, 07-0481-6
U.S. Cl. D13—24



273,105
CASSETTE TAPE RECORDER
Hirotaka Imai, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Sep. 25, 1981, Ser. No. 305,801
Claims priority, application Japan, Apr. 8, 1981, 56-14899
U.S. Cl. D14—6



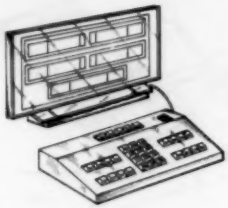
273,106
LOUDSPEAKER
Takekazu Iijima, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 14, 1981, Ser. No. 301,582
Claims priority, application Japan, Mar. 13, 1981, 56-10424
U.S. Cl. D14—30



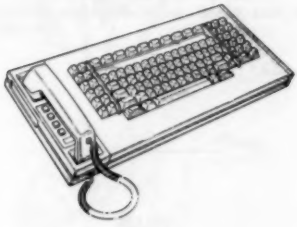
273,107
TELEPHONE INSTRUMENT
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Dec. 4, 1980, Ser. No. 213,067
Claims priority, application Sweden, Jun. 11, 1980, 80001186
U.S. Cl. D14—53

273,108
TELEPHONE INSTRUMENT
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Dec. 4, 1980, Ser. No. 213,092
Claims priority, application Sweden, Jun. 11, 1980, 80001185
U.S. Cl. D14—53

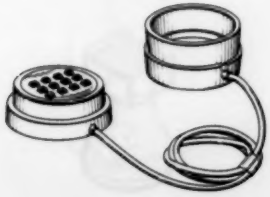
273,109
COMBINED CONTROL DEVICE AND DISPLAY UNIT FOR TELEPHONE EXCHANGE
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Jan. 7, 1981, Ser. No. 223,218
U.S. Cl. D14—58



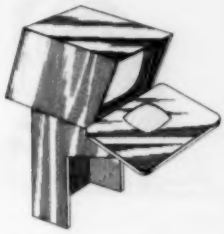
273,110
TELEPRINTER KEYBOARD AND TELEPHONE
Donald M. Genaro, Haworth, and Alvin R. Tilley, Red Bank, both of N.J., assignors to Teletype Corporation, Skokie, Ill.
Filed Nov. 23, 1981, Ser. No. 324,335
U.S. Cl. D14—58



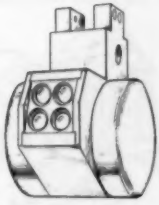
273,111
COMBINED DATA INPUT TERMINAL AND ACOUSTIC COUPLER
Takashi Hirata; Kunio Hirose, both of Yokohama, and Hirohiko Katayama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 28, 1981, Ser. No. 287,867
Claims priority, application Japan, Feb. 9, 1981, 56-4666
U.S. Cl. D14—101



273,112
DISPLAY CONSOLE
Joseph Sliwkowski, Sudbury; Gilbert G. Fryklund, Winchester, and Vance A. Parker, Framingham, all of Mass., assignors to Telesis Corporation of Delaware, Inc., Wilmington, Del.
Filed Jul. 18, 1980, Ser. No. 170,103
U.S. Cl. D14—103

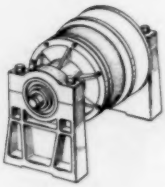


273,113
OPTICAL SCANNER HOUSING OR SIMILAR ARTICLE
Russell D. Knoll, Catlin, Ill., assignor to HurletronAltair, Inc., Danville, Ill.
Filed Nov. 27, 1981, Ser. No. 325,311
U.S. Cl. D14—116

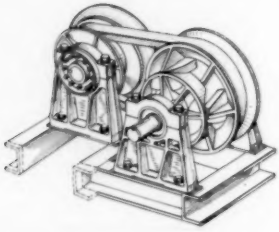


273,114
COMBINED MICROWAVE OVEN AND REFRIGERANT UNIT
Erling Damkjaer, Esbjerg, Denmark, assignor to A/S Vestfrost, Esbjerg, Denmark
Filed Jun. 23, 1981, Ser. No. 276,682
Claims priority, application Denmark, Jan. 28, 1981, 158/81
U.S. Cl. D15—88

273,115
VARIABLE SPEED BELT DRIVE
Robert O. Huff; Edward F. Krome, Jr., and Gebus Barnsfather, all of Columbus, Ind., assignors to Reliance Electric Company, Columbus, Ind.
Filed May 13, 1981, Ser. No. 263,303
U.S. Cl. D15—148



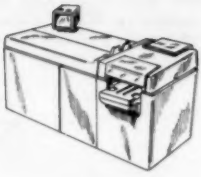
273,116
VARIABLE SPEED BELT DRIVE
Robert O. Huff, Piedmont, S.C.; Edward F. Krome, Jr., and Gebus Barnsfather, both of Columbus, Ind., assignors to Reliance Electric Company, Columbus, Ind.
Filed Sep. 30, 1981, Ser. No. 307,010
U.S. Cl. D15—148



273,117
TYPEWRITER FOR EUROPEAN LANGUAGES
Taro Kasagi, Tokyo, and Kenji Tamada, Kodaira, both of Japan, assignors to Silver Seiko Limited, Japan
Filed Mar. 8, 1982, Ser. No. 355,871
Claims priority, application Japan, Jan. 20, 1982, 57-1831
U.S. Cl. D18—1

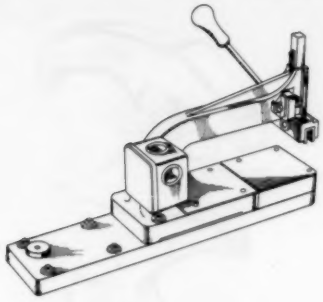
273,118
DESK-TOP ELECTRONIC CALCULATOR
Takashi Hirata, Yokohama, and Hideo Fushimoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 30, 1981, Ser. No. 325,823
Claims priority, application Japan, Jun. 2, 1981, 56-24159
U.S. Cl. D18—7

273,119
INK JET PRINTER
Daniel T. Noonan, Irving, Tex., assignor to The Mead Corporation, Dayton, Ohio
Filed Mar. 8, 1982, Ser. No. 355,448
U.S. Cl. D18—13

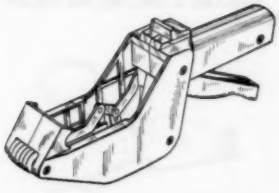


273,120
STAMP
Katsumi Ito, Nagoya, Japan, assignor to Shachihata Industrial Co., Ltd., Japan
Filed Oct. 20, 1981, Ser. No. 313,217
Claims priority, application Japan, Apr. 21, 1981, 56-16969
U.S. Cl. D18—15

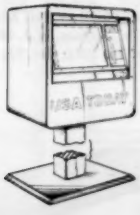
273,121
LUGGAGE MONOGRAMMING MACHINE
Charles E. Rawson, 8073 Kentwood Ave., Los Angeles, Calif. 90045
Filed Dec. 23, 1981, Ser. No. 333,660
U.S. Cl. D18—15



273,122
HAND OPERATED LABEL APPLYING MACHINE
Yo Sato, Tokyo, and Tadao Kashiwaba, Iwate, both of Japan, assignors to Kabushiki Kaisha Sato, Japan
Filed Jun. 7, 1982, Ser. No. 385,767
Claims priority, application Japan, Dec. 8, 1981, 56-54272
U.S. Cl. D18—19



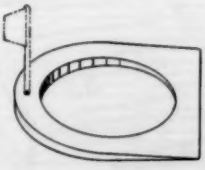
273,123
NEWSPAPER VENDING RACK OR SIMILAR ARTICLE
Fred M. Gore, Dallas, Tex., assignor to Gannett Co., Inc., Rochester, N.Y.
Filed May 12, 1982, Ser. No. 377,439
U.S. Cl. D20—6



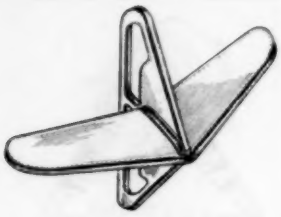
273,124
PLAYING SURFACE FOR A GAME BOARD
John S. Craft, Ellisville, Mo.
Filed Feb. 16, 1982, Ser. No. 348,731
U.S. Cl. D21—34

273,125
ANIMAL FIGURE TOY
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Kiyoshi Hoshino, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 22, 1982, Ser. No. 350,909
Claims priority, application Japan, Sep. 17, 1981, 56-41077
U.S. Cl. D21—150

273,126
GOLF PUTTING TARGET
Peter J. Turza, 1040 Hermitage Dr.; Rudolph A. Jansen, 1730 Kent Rd., and Frank P. Turza, 1650 Chippondale Rd., all of Hoffman Estates, Ill. 60195
Filed Jul. 6, 1981, Ser. No. 280,559
Term of patent 14 years
Int. Cl. D21—*234;8*
U.S. Cl. D21—234

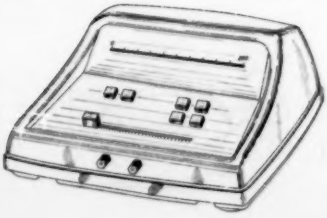


273,127
SWIMMER'S TOWABLE DIVING PLANE
Robert L. Meister, 4404 Old Mill Rd., Fort Wayne, Ind. 46807
Filed Aug. 13, 1980, Ser. No. 177,620
U.S. Cl. D21—236



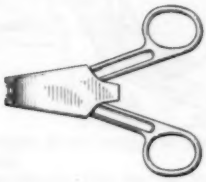
273,128
HANDLE FOR A TOILET SEAT OR THE LIKE
Robert T. Roddick, 522 Hill St., San Francisco, Calif. 94114
Filed Mar. 19, 1981, Ser. No. 245,363
U.S. Cl. D23—71

273,129
ACUPUNCTURE POINT LOCATOR
Robert M. Knox, LaGrange; Kenneth Hartman, DeKalb, and Harold Worby, Maple Park, all of Ill., assignors to Meridia 12 Corporation, Skokie, Ill.
Filed Jan. 19, 1981, Ser. No. 226,197
U.S. Cl. D24—8



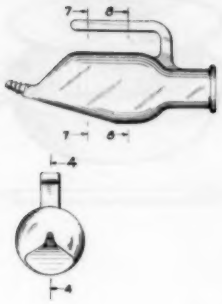
273,130
SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Oct. 2, 1981, Ser. No. 308,085
U.S. Cl. D24—26

273,131
SURGICAL STAPLER
Douglas G. Nolles, New Canaan; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Oct. 2, 1981, Ser. No. 308,087
U.S. Cl. D24—26

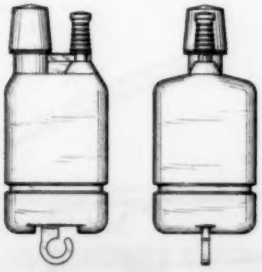


273,132
CORDLESS VIBRATING MASSAGER
Alan Moloff, 6 York Dr., Edison, N.J. 08817
Filed Jun. 18, 1981, Ser. No. 274,763
U.S. Cl. D24—41

273,133
URINAL
Thomas E. Babic, 330 Milliken Ave., and Albert M. Pepe, 334 Ridge Ave., both of Sharpsville, Pa. 16150
Filed Dec. 31, 1981, Ser. No. 336,421
U.S. Cl. D24—54

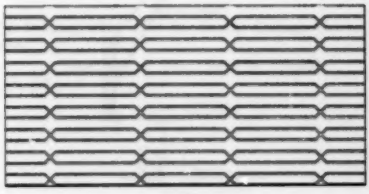


273,134
MEDICAL CONTAINER FOR INJECTABLE SUBSTANCES
Louis T. Pagels, Hanover Park, Ill., assignor to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.
Filed Sep. 4, 1981, Ser. No. 299,308
U.S. Cl. D24—56

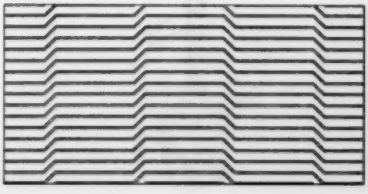


273,135
DISPOSABLE DOUCHE BAG
Nadine J. Mestre, 3127 Cashill Blvd., Reno, Nev. 89509
Filed Nov. 6, 1981, Ser. No. 318,996
U.S. Cl. D24—60

273,136
WALL PANEL
Jose Varela, 1725 W. 33rd Pl., Hialeah, Fla. 33012
Filed Mar. 9, 1982, Ser. No. 356,377
U.S. Cl. D25—80



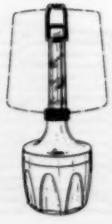
273,137
WALL PANEL
Jose Varela, 1725 W. 33rd Pl., Hialeah, Fla. 33012
Filed Mar. 9, 1982, Ser. No. 356,378
U.S. Cl. D25—80



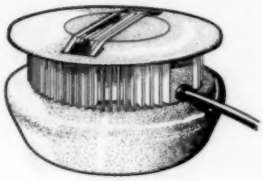
273,138
SUPPORT FOR A CANDLE AND THE LIKE
Donald A. Kaufmann, West Bloomfield, Mich., assignor to Florists' Transworld Delivery Assn., Southfield, Mich.
Continuation-in-part of Ser. No. 140,990, Apr. 17, 1980. This application Aug. 25, 1981, Ser. No. 296,115
U.S. Cl. D26—23

273,139
FISHING LIGHT
Lanny H. Canady, 709 Emerald Garden, North Little Rock, Ark. 72118
Filed Dec. 15, 1980, Ser. No. 216,180
U.S. Cl. D26—61

273,140
TABLE LAMP
Kittson Mann, Kowloon, Hong Kong, assignor to Chung Mei Metal & Plastic Factory Ltd., Kowloon, Hong Kong
Filed Oct. 14, 1981, Ser. No. 311,352
Claims priority, application United Kingdom, Aug. 12, 1981, 1001932
U.S. Cl. D26—93



273,141
HAIR DRYER
Anthony J. Webb, Dorset, England, assignor to F.C.F. Limited, England
Filed Dec. 31, 1980, Ser. No. 221,848
Claims priority, application United Kingdom, Jul. 19, 1980, 995796
U.S. Cl. D28—13



273,142
SHAMPOO SUPPORT DRAIN
Sam A. Briggs, Rte. 1, Box 71AM, Krum, Tex. 76240
Filed Mar. 22, 1982, Ser. No. 360,777
U.S. Cl. D28—20

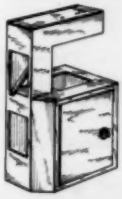
273,143
CUTICLE DEVICE
Axel Jankewitz, Fürth, Fed. Rep. of Germany, assignor to A. W. Faber-Castell, Nuremberg, Fed. Rep. of Germany
Filed Jul. 16, 1982, Ser. No. 399,053
Claims priority, application Fed. Rep. of Germany, May 11, 1982, 7899
U.S. Cl. D28—57

273,144
CUTICLE DEVICE
Axel Jankewitz, Fürth, Fed. Rep. of Germany, assignor to A. W. Faber-Castell, Nuremberg, Fed. Rep. of Germany
Filed Jul. 16, 1982, Ser. No. 399,054
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 7901
U.S. Cl. D28—57

273,145
FACE MASK
Lawrence G. Ponsi, Highland Park, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Dec. 14, 1981, Ser. No. 330,421
U.S. Cl. D29—8

273,146
VACUUM CLEANER INTAKE MEMBER
Grace Farr, 5699 Wedekind Rd., Sparks, Nev. 89431
Filed Sep. 4, 1981, Ser. No. 299,553
U.S. Cl. D32—31

273,147
SERVICE STAND FOR AUTOMOTIVE SERVICE STATION
Landis Iverson, 8411 81st St. South, Cottage Grove, Minn. 55016
Filed Nov. 9, 1981, Ser. No. 319,202
U.S. Cl. D34—6



273,148
COLLAPSIBLE CLEANING CART
Rose L. Lerma, 2895 Freeman Pl., Fremont, Calif. 94536
Filed Oct. 2, 1981, Ser. No. 307,847
U.S. Cl. D34—21

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MARCH, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.F.C.S., Inc.: *See*—
Stevens, Perry; and Brown, Robert E., 4,437,595, Cl. 222-642.000.

A. O. Smith Harvestore Products, Inc.: *See*—
Olson, George E., 4,437,806, Cl. 414-307.000.

A Packaging Service Company, Inc.: *See*—
Szahler, David J., 4,437,566, Cl. 206-1.500.

A. Raymond: *See*—
Andre, Guy, 4,437,633, Cl. 248-68.00R.

A/S Orthana Kemisk Fabrik: *See*—
Balslev, Erik; Hansen, Svenn S.; and Pedersen, Ernst L., 4,438,100, Cl. 424-104.000.

A. Schulman, Inc.: *See*—
Nelson, Wayne F., 4,438,162, Cl. 427-318.000.

Abe, Haruhiko; Harada, Hiroshi; Denda, Masahiko; Nagasawa, Koichi; and Kono, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Plasma treating apparatus. 4,438,368, Cl. 315-39.000.

Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Coin counting and dispensing apparatus. 4,437,478, Cl. 133-5.00R.

Abe, Kelzo: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Kelzo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,438,155, Cl. 427-49.000.

Abe, Takeshi, to Ricoh Co. Ltd. Device of integrating a small amount of flow of fluid for leak detection. 4,437,336, Cl. 73-40.50R.

Abiko, Shuzo: *See*—
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Goto, Hirokazu; and Abiko, Shuzo, 4,438,470, Cl. 360-113.000.

Aboaf, Joseph A.; Klokholm, Erik; and Herd, Sigrid R., to International Business Machines Corporation. Zero to low magnetostriction, high coercivity, polycrystalline, Co-Pt magnetic recording media. 4,438,066, Cl. 420-435.000.

Abraham, John K.: *See*—
Pickens, John W.; Abraham, John K.; Mintus, Raymond E.; and Thomas, Millicent H., 4,437,902, Cl. 148-12.00F.

Abrevaya, Albert: *See*—
Goldstein, Joel; and Abrevaya, Albert, 4,437,429, Cl. 119-1.000.

Abrioux, Andre: *See*—
Saint-Leger, Didier J.; and Abrioux, Andre, 4,438,205, Cl. 436-71.000.

Abu-Shumays, Ahmad; Helmer, John C.; and Luchetti, Stephen J., to Varian Associates, Inc. Single-pump multiple stroke proportioning for gradient elution liquid chromatography. 4,437,812, Cl. 417-53.000.

ACF Industries, Inc.: *See*—
Schipper, Dennis J., 4,437,798, Cl. 406-119.000.

Acker, Rolf-Dieter; Rosay, Phillip A.; Hamprecht, Gerhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Dihydrothiophenecarboxylates and their use for controlling undersirable plant growth. 4,437,878, Cl. 71-90.000.

Ackerman, Bernard, to Ackrad Laboratories, Inc. Securing device for tube insertable in body cavity. 4,437,463, Cl. 128-207.170.

Ackermann, Ulrich; and Ratsch, Eggo, to Versuchsanstalt f. Deutsche Forschungs-u Luft-u Raumfahrt e.V. Noiseless combustion and plasma cutting arrangement. 4,438,316, Cl. 219-121.0PC.

Ackley, Charles E., Jr.: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,437,559, Cl. 198-397.000.

Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., to R. W. Hartnett Company. Method and apparatus for removing non-rectified capsules from a capsule rectification and transport device. 4,437,559, Cl. 198-397.000.

Ackrad Laboratories, Inc.: *See*—
Ackerman, Bernard, 4,437,463, Cl. 128-207.170.

Acme Highway Products Corp.: *See*—
Puccio, Guy S., 4,437,785, Cl. 404-64.000.

Acos Finos Piratini S.A.: *See*—
Martin, Clovis L., 4,437,835, Cl. 432-103.000.

Acroseal Window Corporation: *See*—
Young, Alfred G.; Slocomb, Leon F., Jr.; and Bugg, Francis V., 4,438,430, Cl. 340-547.000.

Adams, Gary V.; and Schneiter, Fred E., to Thiokol Corporation. Inflator for a protective inflatable cushion system. 4,437,681, Cl. 280-733.000.

Adell, Robert, to U.S. Product Development Company. Method of manufacturing edge guards. 4,437,916, Cl. 156-222.000.

Adkins, Joey B., to Issa, Darrell E. Electronic key anti-theft system. 4,438,426, Cl. 340-64.000.

Adler, Peter K., deceased: *See*—
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.

Advanced Micro Devices, Inc.: *See*—
Chuang, Patrick T.; Keswick, Paul D.; and Linden, Jeffrey L., Sr., 4,438,346, Cl. 307-297.000.

Harmon, William J., Jr.; Mick, John R.; and Coleman, Vernon, 4,438,492, Cl. 364-200.000.

Aero Environmental Limited: *See*—
Brooker, Michael F. C.; McKerihen, Steven J.; Attwala, Hashmukrai D.; and Cautillo, Antonio L., 4,437,831, Cl. 431-177.000.

Aero-Motive Mfg. Co.: *See*—
Rosenberg, Irwin, 4,437,624, Cl. 242-107.300.

Agency of Industrial Science and Technology: *See*—
Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,437,416, Cl. 110-245.000.

Agfa-Gevaert AG: *See*—
Ehgartner, Gabriele; and Vondrovsky, Gabriel, 4,437,749, Cl. 354-214.000.
Engelsmann, Dieter; Hackenberg, Hubert; Lermann, Peter; Wagner, Karl; and Zobel, Siegfried, 4,437,751, Cl. 354-214.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Kunitz, Friedrich-Wilhelm; and Schranz, Karl-Wilhelm, 4,438,195, Cl. 430-566.000.
Pfeifer, Josef; and Rheude, Alfred, 4,438,164, Cl. 428-35.000.

Agosta, A. Richard. Adjustable patient corrective support apparatus. 4,437,702, Cl. 297-284.000.

Ahrens, Max; and Haissig, Manfred, to Boehler Aktiengesellschaft. Method for control of billet stripping. 4,437,509, Cl. 164-454.000.

Aida Castellanos Kwasniak: *See*—
Castellanos Manero, Carlos E., 4,437,252, Cl. 42-89.000.

Air Products and Chemicals, Inc.: *See*—
Newton, Charles L.; and Puini, Dennis L., 4,437,312, Cl. 60-648.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Nomura, Ishi; and Akagi, Motonobu, 4,437,645, Cl. 251-65.000.
Yamazawa, Masayuki, 4,437,423, Cl. 112-292.000.

Aizawa, Hidekuni: *See*—
Miyashita, Takao; Aizawa, Hidekuni; and Takamiya, Toru, 4,437,778, Cl. 400-208.000.

Ajiro, Tamotu: *See*—
Miyamoto, Akira; Shimizu, Senzo; Harada, Masahiro; Ajiro, Tamotu; and Hara, Hideki, 4,438,257, Cl. 528-347.000.

Akademii Nauk Ukrainsko: *See*—
Safonnikov, Anatoly N.; and Antonov, Anatoly V., 4,438,313, Cl. 219-73.100.

Akagi, Motonobu: *See*—
Nomura, Isshi; and Akagi, Motonobu, 4,437,645, Cl. 251-65.000.

Akashi, Akira; Katsuma, Makoto; Kawamura, Masaharu; Kamata, Shigeru; and Saito, Syuichiro, to Canon Kabushiki Kaisha. Safety device for camera and accessory. 4,437,752, Cl. 354-289.000.

Akimoto, Masahiro: *See*—
Nomoto, Reishi; Akimoto, Masahiro; and Takahashi, Masayoshi, 4,437,465, Cl. 128-340.000.

Akita, Yoshio; Maruyama, Toshinori; and Muto, Katsuya, to Nippondenso Co., Ltd. Generation indicating apparatus for vehicle alternators. 4,438,384, Cl. 320-48.000.

Akiyama, Masataka: *See*—
Shimada, Kazuo; Akiyama, Masataka; and Sudo, Masami, 4,438,093, Cl. 424-50.000.

Akzo N.V.: *See*—
Sanders, Adrianus L. M.; Meuleman, Dirk G.; Moelker, Huibert C. T.; van Dedem, Gijsbert W. K.; and van Houdenhoven, Francois E. A., 4,438,108, Cl. 424-183.000.
Zengel, Hans-Georg; Kersten, Hilde; and Magerlein, Helmut, 4,437,960, Cl. 204-181.00C.

Albany International Plastic B.V.: *See*—
van der Ploeg, Dirk C. H.; and Tameris, Hendrikus M., 4,437,787, Cl. 425-84.000.

Albaugh, Neil P.: *See*—
Stitt, Robert M.; and Albaugh, Neil P., 4,438,338, Cl. 250-551.000.

Albert, Donald; and Tremaglio, Anthony M., to Miracle Products, Inc. Switched rectifier disc for Edison sockets. 4,438,344, Cl. 307-146.000.

Alberta Oil Sands Technology and Research Authority: *See*—
Boorman, Philip M.; Chivers, Tristram; Tavares, Donald F.; and Mahadev, Kalabeerappa N., 4,438,218, Cl. 502-220.000.

Albertson, Kurt D.: *See*—
Ashcraft, Charles R.; and Albertson, Kurt D., 4,438,175, Cl. 428-315.500.

Alcon Laboratories, Inc.: *See*—
York, Billie M., Jr., 4,438,272, Cl. 548-308.000.

Aldenhoven, Ghislanus M. A. M., to U.S. Philips Corporation. Mechanism responsive to rotation stoppage, and tape recorder with such mechanism. 4,437,626, Cl. 242-186.000.

Alfano, Robert R.: *See*—
Schiller, Norman H.; and Alfano, Robert R., 4,438,416, Cl. 333-160.000.

Allan, Keith, to FBC Limited. Pesticidal compositions employing amitraz with stabilizer. 4,438,137, Cl. 424-330.000.

Allard, Gilbert. Fishing leader holder. 4,437,258, Cl. 43-57.100.

Allec, Josiane: *See*—
Grollier, Jean-Francois; and Allec, Josiane, 4,438,095, Cl. 424-70.000.

Allen, Lloyd E.; and Riblet, Leslie A., to Mead Johnson & Company. Method for alleviation of extrapyramidal motor disorders. 4,438,119, Cl. 424-251.000.

Allen, Malcolm L.: *See*—
DelGreco, Angela G.; Allen, Malcolm L.; and Jacobse[illegible]onald L., 4,438,024, Cl. 252-545.000.

Allied Corporation: *See*—
Greutmann, Hans, 4,437,230, Cl. 29-597.000.
Mallik, Arjun; Koetters, Daniel; and Edelstein, Harold, 4,438,017, Cl. 252-301.170.
Nalewajek, David, 4,438,078, Cl. 423-21.500.
Tajkowski, Edward G., 4,438,026, Cl. 252-545.000.

Allington, Robert W., to ISCO, Inc. Lamp circuit. 4,438,370, Cl. 315-106.000.

Allison, Richard: *See*—
Harrington, Alan L.; Allison, Richard; and Rodov, Vladimir, 4,438,448, Cl. 357-23.000.

Alps Electric Co., Ltd.: *See*—
Hori, Fumihisa, 4,437,777, Cl. 400-154.200.

Alston, Lawrence E., to Polaroid Corporation. Constant light greyscale generator for CRT color camera system. 4,438,453, Cl. 358-78.000.

Aluminium Pechiney: *See*—
Gerphagnon, Jean-Louis; and Wolter, Claude, 4,437,964, Cl. 204-245.000.

Aluminum Company of America: *See*—
van Linden, Jan H. L., 4,437,650, Cl. 266-144.000.

Amano, Kazunori; and Sekiwaga, Youichi, to Toshiba Heating Appliances Co., Ltd. Lamp wick equipment for a combustion apparatus. 4,437,832, Cl. 431-304.000.

American Cyanamid Company: *See*—
Casey, Donald J.; and Huffman, Kenneth R., 4,438,253, Cl. 528-86.000.

American Home Products Corporation: *See*—
Helfer, Joel N.; and King, Phillip W., 4,437,467, Cl. 128-642.000.
Winkley, Michael W.; and Childress, Scott J., 4,438,031, Cl. 260-112.50R.

American Hospital Supply Corporation: *See*—
Borsanyi, Alexander S., 4,437,990, Cl. 210-321.300.

American Microsystems, Incorporated: *See*—
Haque, Yusuf A.; Saletore, Vikram; and Schuler, Jeffrey A., 4,438,354, Cl. 307-493.000.

American Safety Equipment Corporation: *See*—
Wyder, Manfred, 4,437,623, Cl. 242-107.200.

American Standard Inc.: *See*—
Pascoe, Robert D., 4,437,632, Cl. 246-34.00R.

Ameron, Inc.: *See*—
Magarian, Gerald M.; and Friedrich, Ralph S., 4,437,616, Cl. 242-7.020.

AMF Incorporated: *See*—
Brown, Robert L., 4,437,243, Cl. 33-302.000.

Amiel, Abraham J.: *See*—
Nir, Aharon; Amiel, Abraham J.; and Krant, Jonathan M., 4,437,263, Cl. 47-1.00R.

Ammons, Edward A., to Ford Motor Company. Carburetor engine idle speed air bypass. 4,438,049, Cl. 261-42.000.

AMP Incorporated: *See*—
Bianchi, Edward A., 4,437,722, Cl. 339-97.00P.
Eaby, Daniel G.; Long, William B.; and Shuey, John R., 4,437,725, Cl. 339-156.00R.

Ampex Corporation: *See*—
Fawkes, John S.; and Umholtz, Walter F., 4,438,466, Cl. 360-66.000.

Anahara, Meiji; and Omori, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. False twisting air nozzle. 4,437,302, Cl. 57-333.000.

Anderson, Harold R.; and Hamilton, Roland M., to United States of America, Air Force. Service platform for a ladder. 4,437,544, Cl. 182-120.000.

Anderson, Inge; and Johansson, Ronny. Building structure. 4,437,285, Cl. 52-481.000.

Andersson, Karl G. B., to Duni Bila AB. Pad with shape adapting properties. 4,438,163, Cl. 428-35.000.

Anding, Norbert: *See*—
Arens, Egidius; Hampe, Christoph; Karlowsky, Ingo; Meyersieck, Manfred; Schwarz, Hans D.; Anding, Norbert; and Leisterer, Reinhard, 4,438,438, Cl. 343-451.000.

Ando, Naoyoshi: *See*—
Ishii, Yoshiaki; Kuwe, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,437,416, Cl. 110-245.000.

Ando, Tetsuo: *See*—
Tamura, Hisashi; Ito, Ichizo; Hirayama, Masashi; and Ando, Tetsuo, 4,437,350, Cl. 73-861.240.

Andre, Guy, to A. Raymond. Elastic fastening clamp for round bars or cables of various diameters. 4,437,633, Cl. 248-68.00R.

Andrews, Edward W.: *See*—
Collins, Arthur K.; Andrews, Edward W.; and Srinivasan, Nallaswamy, 4,438,495, Cl. 364-414.000.

Antares Engineering, Inc.: *See*—
Gates, Donald C., 4,437,335, Cl. 73-37.900.

Antonov, Anatoly V.: *See*—
Safonnikov, Anatoly N.; and Antonov, Anatoly V., 4,438,313, Cl. 219-73.100.

Anver S.A.: *See*—
Bichet, Lucien, 4,437,921, Cl. 156-475.000.

Aoki, Ryuji: *See*—
Takata, Masahiro; Aoki, Ryuji; and Sato, Takahisa, 4,438,217, Cl. 502-205.000.

Aoki, Tomohiro: *See*—
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.

Aonuma, Masashi: *See*—
Umemura, Shizuo; Matsufuji, Akihiro; Aonuma, Masashi; Kitamoto, Tatsuji; and Miyatsuka, Hajime, 4,437,882, Cl. 75-0.50R.

Aoshima, Terutaka: *See*—
Narita, Ryuho; Yamamori, Kenji; Oota, Hiroyuki; and Aoshima, Terutaka, 4,438,324, Cl. 219-441.000.

Aotsu, Hiroaki: *See*—
Sato, Hiroyasu; Yamamoto, Kazuaki; and Aotsu, Hiroaki, 4,438,385, Cl. 322-28.000.

Aoyama, Masahide: *See*—
Sano, Jun; Aoyama, Masahide; and Kubo, Daijiro, 4,438,353, Cl. 307-477.000.

APM Corporation: *See*—
Morse, Milton, 4,438,300, Cl. 179-184.000.

Appleby, Paul E.; and Brinkley, Max D., to Goodyear Tire & Rubber Company, The. Method of curing removable tread belt. 4,437,915, Cl. 156-126.000.

Appor Limited: *See*—
Banks, Stewart, 4,437,585, Cl. 222-181.000.

Aquarium Pharmaceuticals, Inc.: *See*—
Goldstein, Joel; and Abrevaya, Albert, 4,437,429, Cl. 119-1.000.

Araki, Masafumi: *See*—
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, 4,437,304, Cl. 60-290.000.
Ikenoya, Yasuo; Araki, Masafumi; and Shimizu, Yozi, 4,437,305, Cl. 60-293.000.

Araki, Masatada; and Tanaka, Yukio, to Nippon Oil and Fats, Co., Ltd. Cutting tool. 4,437,800, Cl. 407-119.000.

Araki, Shigeru; Taki, Yasuo; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, to Matsushita Electric Industrial Co., Ltd. Electronic parts mounting apparatus. 4,437,232, Cl. 29-740.000.

Aramaki, Minoru; Kita, Yasushi; Nakano, Hishagi; and Moroi, Shiro, to Central Glass Company Limited. Method for preparation of graphite fluoride by contact reaction between carbon and fluorine gas. 4,438,086, Cl. 423-448.000.

Arcair Company: *See*—
Rieppel, Perry J.; and Moore, Paul E., 4,437,649, Cl. 266-48.000.

Arcamone, Federico: *See*—
Suarato, Antonino; Penco, Sergio; Arcamone, Federico; and Casazza, Anna M., 4,438,105, Cl. 424-180.000.

Archer, Wesley L.; Lynn, Vicki A.; and Dallessandro, Susan M., to Dow Chemical Company, The. Photoresist stripper composition and method of use. 4,438,192, Cl. 430-329.000.

Arend, Raymond J.: *See*—
Plattner, Robert F.; Arend, Raymond J.; and VerBerkmoes, John A., 4,437,396, Cl. 99-475.000.

Arens, Egidius; Hampe, Christoph; Karlowsky, Ingo; Meyersieck, Manfred; Schwarz, Hans D.; Anding, Norbert; and Leisterer, Reinhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for displaying a battle situation. 4,438,438, Cl. 343-451.000.

Arita, Yoji; and Seo, Yuzo, to Itsubishi Keikinzoku Kogyo Kabushiki Kaisha. Method of controlling aluminum electrolytic cells. 4,437,950, Cl. 204-67.000.

Arkans, Edward J., to Kendall Company, The. Device for applying indicia to an elastic web. 4,437,408, Cl. 101-426.000.

Armantrout, Robert J.; Gerpheide, George E.; and Wilson, Robert F., deceased (by Wilson, Robert D., personal representative), to Wilson, Robert D., personal representative of Robert F. Wilson, deceased. Golf Game simulating apparatus. 4,437,672, Cl. 273-185.00B.

Armiger, Dennis L. Domestic electric generator and steam heating plant. 4,438,340, Cl. 290-2.000.

Armstrong World Industries, Inc.: *See*—
Herweh, John E., 4,438,251, Cl. 528-73.000.

Arpin, Michael D.: *See*—
Leon, Thomas B.; and Arpin, Michael D., 4,438,482, Cl. 362-103.000.

Asada, Hideki: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Takahashi, Mitsuo; Asada, Hideki; and Kurahashi, Masaru, 4,438,041, Cl. 260-464.000.

Asahi Seiko Kabushiki Kaisha: *See*—
Abe, Hiroshi, 4,437,478, Cl. 133-5.00R.

Asai, Setsuro, to Hitachi, Ltd. Absorption cooling and heating system. 4,437,321, Cl. 62-324.200.

Ashcraft, Charles R.; and Albertson, Kurt D., to Mobil Oil Corporation. Synthetic film with a paper-like surface and method of forming same. 4,438,175, Cl. 428-315.500.

Ashiba, Masahiro, to Tokico Ltd. Shock absorber. 4,437,548, Cl. 188-289.000.

Ashland Food Technology Holdings S.A.: *See*—
Becker, Heinz, 4,437,206, Cl. 17-1.00F.

Ashland Oil, Inc.: *See*—
Kovach, Stephen M., 4,437,981, Cl. 208-253.000.

Ashley, William B.: *See*—
Casper, Paul W.; and Ashley, William B., 4,438,348, Cl. 307-310.000.

Astier, Louis. Assembly forming interfitting socket and plug for connection to a circuit in which the socket is mounted, without the circuit opening. 4,438,303, Cl. 200-51.100.

Astle, William H., to Tri Tool, Inc. Tool carrier for portable lathe. 4,437,366, Cl. 82-4.00C.

Astro Machine Corp.: *See*—
Selak, Martin, 4,437,657, Cl. 271-100.000.

Asulab S.A.: *See*—
Dinger, Rudolf; Michel, Jean-Georges; and Leuenberger, Claude-Eric, 4,437,773, Cl. 374-117.000.

Atcor: *See*—
Bardina, Juan; and Gonzalez, Mikel, 4,437,479, Cl. 134-68.000.

Ateliers Sussmeyer SPRL: *See*—
Sussmeyer, Robert; Pluvinage, Alain; and Moenaert, Christian, 4,437,940, Cl. 203-49.000.

Athena Controls Inc.: *See*—
Metz, Bruce E., 4,437,853, Cl. 493-302.000.

Atkinson, Paul J., to Zenith Radio Corporation. Spark gap for line transient protection. 4,438,365, Cl. 313-325.000.

Atlanta Stove Works, Inc.: *See*—
Wysong, Charles F., 4,437,451, Cl. 126-77.000.

Atlantic Richfield Company: *See*—
Peterman, Lee G.; and Staebel, Raymond J., 4,438,069, Cl. 422-62.000.

Attanasio, Michael P. Arrow projecting handbow. 4,437,449, Cl. 124-22.000.

Attwala, Hashmukrai D.: *See*—
Brooker, Michael F. C.; McKerihen, Steven J.; Attwala, Hashmukrai D.; and Cautillo, Antonio L., 4,437,831, Cl. 431-177.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Wilmers, Gottlieb, 4,437,644, Cl. 251-11.000.

Auerbach, Abraham: *See*—
Eichelberger, Charles W.; Wojnarowski, Robert J.; and Auerbach, Abraham, 4,438,291, Cl. 136-236.00R.

Ausmus, Donald L. Vehicle for supporting handicapped occupants. 4,437,537, Cl. 180-313.000.

Ausschnitt, Christoper P., to Perkin-Elmer Corp., The. Reusable electrical overlay measurement circuit and process. 4,437,760, Cl. 355-133.000.

Autech Corporation: *See*—
Cullen, Donald L.; and Robertson, John A., 4,438,402, Cl. 324-452.000.

Automobiles Citroen: *See*—
Dore, Jacques, 4,437,331, Cl. 72-360.000.

Automobiles Peugeot: *See*—
Dore, Jacques, 4,437,331, Cl. 72-360.000.

Aviatec, Inc.: *See*—
Garoffolo, Frank, 4,437,573, Cl. 212-263.000.

Ayad, Hafez M., to Union Carbide Corporation. Chewing insect toxicant compositions. 4,438,110, Cl. 424-217.000.

Aykanian, Ardashus A.: *See*—
Richter, Simon J.; and Aykanian, Ardashus A., 4,438,061, Cl. 264-249.000.

Azzariti, Vittorio. Burn treatment. 4,438,099, Cl. 424-93.000.

B. F. Goodrich Company, The: *See*—
Kramer, James H.; Orndorff, Roy L., Jr.; and Stephens, James M., 4,437,688, Cl. 285-95.000.

Baba, Kenji: *See*—
Saito, Yukio; Nogita, Shunsuke; Watanabe, Syoji; and Baba, Kenji, 4,437,992, Cl. 210-603.000.

Babitzka, Rudolf; and Linder, Ernst, to Robert Bosch GmbH. Electrically controlled mechanical positioning device. 4,438,363, Cl. 310-328.000.

Baker International Corporation: *See*—
Bianchi, David C.; and Crowe, Talmadge L., 4,437,517, Cl. 166-120.000.
Cockrell, Darryl W., 4,437,516, Cl. 166-120.000.

Baker, Marvin E. Roll-out flame detector for swimming pool heater fuel gas control. 4,437,829, Cl. 431-21.000.

Baker Oil Tools, Inc.: *See*—
Krause, William F., Jr.; and Hopmann, Mark E., 4,437,522, Cl. 166-382.000.

Baker, Richard W., to United States of America, Interior. Extraction of metal ions from aqueous solution. 4,437,994, Cl. 210-638.000.

Bakker, Arie, to Bamach, B. V. Process for the preparation of a foodstuff consisting of a stuffing rolled in a wrap. 4,438,145, Cl. 426-297.000.

Ball, Larry L.: *See*—
Haskin, John R., deceased, 4,437,739, Cl. 353-27.00R.

Balser, Klaus; Tuebner, Helwig; and Oppermann, Wilhelm, to Bayer Aktiengesellschaft. Process for the production of hydroxyethyl methyl cellulose. 4,438,264, Cl. 536-91.000.

Balslev, Erik; Hansen, Svenn S.; and Pedersen, Ernst L., to A/S Orthana Kemisk Fabrik. Sterilized preserved, stable mucine-containing solutions. 4,438,100, Cl. 424-104.000.

Bamach, B. V.: *See*—
Bakker, Arie, 4,438,145, Cl. 426-297.000.

Banke, Karl-Heinz; Hering, Elisabeth; Lobel, Wilfried; Pollack, Dieter; Wiedemann, Gunter; Grell, Ute; and Schuler, Ingo, to Forschungsinstitut fur Textiltechnologie. Making a fibrillated synthetic-resin strand. 4,438,053, Cl. 264-25.000.

Banks, Bruce A., to United States of America, National Aeronautics and Space Administration. Diamondlike flake composites. 4,437,962, Cl. 204-192.00C.

Banks, Stewart, to Appor Limited. Dispensers. 4,437,585, Cl. 222-181.000.

Baran, Paul, to Telebit Corporation. Packetized ensemble modem. 4,438,511, Cl. 370-19.000.

Barber-Colman Company: *See*—
Trost, Wayne C., 4,438,173, Cl. 428-221.000.

Barbereau, Jean-Luc: *See*—
Londos, Rene; and Barbereau, Jean-Luc, 4,437,808, Cl. 414-667.000.

Barbier, Jean-Paul; and Lerouyer, Gilbert, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process of gaseous opalization of light bulbs. 4,438,152, Cl. 427-37.000.

Barbour, William P., to DBS, Inc. Electric data recorder. 4,437,404, Cl. 101-269.000.

Barclay, Andrew C.: *See*—
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., 4,438,212, Cl. 501-73.000.

Bardina, Juan; and Gonzalez, Mikel, to Atcor. Decontamination apparatus for semiconductor wafer handling equipment. 4,437,479, Cl. 134-68.000.

Bareuther, Ernst: *See*—
Pietsch, Hartmut; Turke, Wolfgang; Bareuther, Ernst; Kampf, Fritz; and Bings, Hubert, 4,438,076, Cl. 423-30.000.

Barnabe, Jean-Louis, to Regie Nationale des Usines Renault. Metal alloy with high catalytic activity. 4,437,926, Cl. 156-654.000.

Barnett, William E., to Riker Laboratories, Inc. Anticoagulant substance. 4,438,261, Cl. 536-21.000.

Barniak, Richard L. Drinking vessel with self-contained straws. 4,437,576, Cl. 220-90.400.

Barry, Leon F.: *See*—
Gluck, David G.; and Barry, Leon F., 4,438,166, Cl. 428-113.000.

Bartsch, Wolfgang: *See*—
Ross, Carl H.; Kampe, Wolfgang; Bartsch, Wolfgang; Sponer, Gisbert; and Roesch, Egon, 4,438,116, Cl. 424-250.000.

BASF Aktiengesellschaft: *See*—
Acker, Rolf-Dieter; Rossy, Phillip A.; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,437,878, Cl. 71-90.000.
Brandstetter, Franz; Hambrecht, Juergen; Jung, Rudolf H.; and Lindenschmidt, Gerhard, 4,438,237, Cl. 525-183.000.
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.
Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, 4,438,462, Cl. 360-2.000.
Lardon, Hartmut; and Seybold, Guenther, 4,438,282, Cl. 568-58.000.
Oeder, Dieter; Ziegler, Walter; Daeuble, Manfred; Dietsche, Wolfram; Hettche, Albert; and Weiss, Stefan, 4,438,008, Cl. 252-56.00R.
Oppenlaender, Knut; Strickler, Rainer; Seib, Karl; and Naegele, Paul, 4,438,094, Cl. 424-59.000.
Rapp, Guenther; Thomas, Erwin; and Muenster, Rolf, 4,438,084, Cl. 423-387.000.

BASF Wyandotte Corporation: *See*—
Brizgys, Bernardas, 4,438,235, Cl. 524-700.000.
Christman, Donald L.; and Merkl, Bernard A., 4,438,248, Cl. 528-57.000.

Bast, Bernard J., to Bethlehem Steel Corporation. Method for producing a corrugated pipe having a smooth lining of foam plastic. 4,438,056, Cl. 264-45.200.

Bastian Blessing Co., Inc.: *See*—
Plattner, Robert F.; Arend, Raymond J.; and VerBerkmoes, John A., 4,437,396, Cl. 99-475.000.

Battelle Memorial Institute: *See*—
Prost, Jean-Louis, 4,437,470, Cl. 128-679.000.
Siddiqi, Iqbal, 4,438,067, Cl. 422-56.000.

Battle, Billy J., to United States Pipe and Foundry Company. Flexible gauge for inside dimensions. 4,437,242, Cl. 33-178.00B.

Bauer, Eckhart: *See*—
Gruber, Peter; Schmid, Jochen; Lechner, Horst; and Bauer, Eckhart, 4,438,091, Cl. 424-21.000.

Bauer, Wilfried; Cardinaux, Francois; Huguenin, Rene; Plesa, Janos; and Sandrin, Edmond, to Sandoz Ltd. Organic compounds. 4,438,103, Cl. 424-177.000.

Baughman, Richard J.; and Ginley, David S., to United States of America, Energy. Photoelectrochemical cell having photoanode with thin boron phosphide coating as a corrosion resistant layer. 4,438,183, Cl. 429-111.000.

Baumgartner, Hans, to Pierburg GmbH & Co., KG. Pneumatically operated servo-motor and control method therefor. 4,437,386, Cl. 91-363.00R.

Baxter Travenol Laboratories, Inc.: *See*—
Wicnienski, Michael F., 4,438,357, Cl. 307-597.000.

Bayer Aktiengesellschaft: *See*—
Balser, Klaus; Tuebner, Helwig; and Oppermann, Wilhelm, 4,438,264, Cl. 536-91.000.
Boberg, Michael; Habich, Dieter; Metzger, Karl G.; and Naab, Paul, 4,438,114, Cl. 424-248.510.
Dorner, Florian, 4,437,582, Cl. 222-94.000.

Grogler, Gerhard; Ganster, Otto; and Recker, Klaus, 4,438,250, Cl. 528-66.000.
Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,438,122, Cl. 424-263.000.
Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,438,275, Cl. 549-434.000.
Petersen, Uwe; Stadler, Peter; Lockhoff, Oswald; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,438,260, Cl. 536-13.900.
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,438,060, Cl. 264-206.000.
Schmitz-Josten, Robert; Suling, Carlhans; Podszun, Wolfgang; Bomer, Bruno; Borgardt, Manfred; and Walkowiak, Michael, 4,437,836, Cl. 433-199.000.

BBC Brown, Boveri & Company, Limited: *See*—
Korner, Gerhard; and Rees, Volker, 4,438,308, Cl. 200-148.00A.

Bean, William C.: *See*—
Tao, Thomas M.; and Bean, William C., 4,437,917, Cl. 156-296.000.

Beck, Alexander F.; and Winter, Joseph, to Olin Corporation. Method and apparatus for bonding metal wire to a base metal substrate. 4,437,943, Cl. 204-16.000.

Beck, Martin H.: *See*—
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,437,825, Cl. 425-145.000.

Beck, Robert L. R., to Boeing Company, The. Integral actuator and sequencing valve. 4,437,387, Cl. 91-401.000.

Becker, Hal C. Apparatus for controlled stopper extraction from and reinsertion in sparkling wine bottles. 4,437,360, Cl. 81-3.440.

Becker, Heinz, to Ashland Food Technology Holdings S.A. Multiple reusable tubular casing, and apparatus and process for using same in the production of caseless (skinless) parboil or raw sausages. 4,437,206, Cl. 17-1.00F.

Beckman Instruments, Inc.: *See*—
Glenn, Thomas J.; and Kaye, Wilbur I., 4,437,762, Cl. 356-326.000.
Kaye, Wilbur I., 4,437,763, Cl. 356-326.000.
Stephens, Donald E.; and Sharples, Thomas D., 4,438,070, Cl. 422-70.000.

Bedin, Jean, to Etablissements Larrieubedin "La Girondine". Automatic machine for capping and labelling bottles or like containers. 4,437,289, Cl. 53-64.000.

Beecham Group Limited: *See*—
Corbett, David F.; Southgate, Robert; and Coulton, Steven, 4,438,036, Cl. 260-245.20T.
Ponsford, Roger J.; and Howarth, Thomas T., 4,438,101, Cl. 424-114.000.

Beers, Melvin D.; and Surprenant, Richard P., to General Electric Company. Titanium chelate catalyst for silicone compositions. 4,438,039, Cl. 260-429.500.

Begin, John D.: *See*—
Juengel, Richard O.; Begin, John D.; and Khalaf, John, 4,437,240, Cl. 33-172.00E.

Behrenz, Wolfgang: *See*—
Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,438,275, Cl. 549-434.000.

Bell, Allyn R.; Doweyko, Arthur M. P.; and Minatelli, John A., to Uniroyal, Inc. 2-Ethylsulfonyl pyridine 1-oxide derivatives. 4,438,271, Cl. 546-294.000.

Bell Telephone Laboratories, Incorporated: *See*—
Cais, Rudolf E., 4,438,247, Cl. 526-249.000.
Copeland, John A., III; and Miller, Stewart E., 4,438,447, Cl. 357-19.000.
Favin, David L., 4,438,504, Cl. 364-724.000.
Okinaka, Yutaka; Smith, Craig G.; and Smith, Lawrence E., 4,437,948, Cl. 204-52.00R.
Rubin, Harvey, 4,438,298, Cl. 179-175.20R.
Sheng, Tan T.; Sinha, Ashok K.; and Vaidya, Sheila, 4,438,450, Cl. 357-68.000.
Steinberger, Michael L., 4,438,530, Cl. 455-278.000.
Tsang, Won-Tien, 4,438,446, Cl. 357-17.000.

Bendix Corporation, The: *See*—
Leach, Earl A., Jr., 4,438,421, Cl. 336-65.000.
Lewis, David L., 4,437,801, Cl. 409-232.000.

Benicek, Jeanne A.; and Schrader, Rodney W., to S. C. Johnson & Son, Inc. Low solvent laundry pre-spotting composition. 4,438,009, Cl. 252-90.000.

Bennett, Nicholas L. Apparatus and method of reducing trees to firewood. 4,437,368, Cl. 83-13.000.

Benoit, Louis J. Single-ply roofing system. 4,437,283, Cl. 52-410.000.

Beres, Ernest A.: *See*—
Stavitsky, David; and Beres, Ernest A., 4,437,641, Cl. 249-79.000.

Beretta, Pier C., to Fabbrica d'Armi P Beretta S.p.A. Revolver. 4,437,250, Cl. 42-59.000.

Berg, Winfred M., to Winfred M. Berg, Inc. Replacement drive belt. 4,437,849, Cl. 474-256.000.

Bernard, Walter J., to Sprague Electric Company. Stabilization of aluminum electrolytic capacitor foil. 4,437,946, Cl. 204-35.00N.

Best, Gerd; and Dlugosch, Gunter, to Krampe & Co. Fertigung in Bergbaubedarf GmbH. Spraying nozzle arrangement. 4,437,707, Cl. 299-81.000.

Best Lock Corporation: *See*—
Foshee, William R., 4,437,695, Cl. 292-352.000.

Bethlehem Steel Corporation: *See*—
Bast, Bernard J., 4,438,056, Cl. 264-45.200.

Bettge, Hans: *See*—
Lippmann, Hans-Joachim; Peche, Gerhard; and Bettge, Hans, 4,438,307, Cl. 200-144.00B.

Bey, Philippe; and Jung, Michel, to Merrell Toraude et Compagnie. α-Halomethyl derivatives of α-amino acids. 4,438,270, Cl. 546-243.000.

Bhise, Vijay S.; and Hoch, Robert, to Halcon SD Group, Inc., The. Process for recovering ethylene oxide from aqueous solutions. 4,437,938, Cl. 203-14.000.

Bhise, Vijay S.; and Hoch, Robert, to Halcon SD Group, Inc., The. Process for separating ethylene oxide from aqueous solutions. 4,437,939, Cl. 203-14.000.

Bhojwani, Arju H.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., 4,437,979, Cl. 208-153.000.

Bianchi, David C.; and Crowe, Talmadge L., to Baker International Corporation. Slip mechanism for subterreanean wells. 4,437,517, Cl. 166-120.000.

Bianchi, Edward A., to AMP Incorporated. Coaxial cable tap. 4,437,722, Cl. 339-97.00P.

Bianchi, Giuseppe, to Grove Valve and Regulator Company. Line removable valve structure with pipeline support means. 4,437,486, Cl. 137-315.000.

Biax Fiberfilm Corporation: *See*—
Schwarz, Eckhard C. A., 4,438,167, Cl. 428-138.000.

Bichet, Lucien, to Anver S.A. Press for gluing footwear elements. 4,437,921, Cl. 156-475.000.

Biegert Aviation, Inc.: *See*—
Jefferies, James C., 4,437,630, Cl. 244-136.000.

Bieneck, Heinz; Finkbeiner, Rudolf; and Wick, Wilhelm, to Steag Kernenergie GmbH. Container and closure means for storage of radioactive material. 4,437,578, Cl. 220-256.000.

Bierkarre, Hartwig; Klinger, Gottfried; Radeloff, Jurgen; and Rust, Bernd-Hendrik, to Jungheinrich Unternehmensuerwaltung KG, Firma. System for monitoring the course and for controlling the braking of a freely movable vehicle, particularly an inductively steered vehicle, and vehicle with such a system. 4,437,533, Cl. 180-168.000.

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Bings, Hubert: *See*—
Pietsch, Hartmut; Turke, Wolfgang; Bareuther, Ernst; Kampf, Fritz; and Bings, Hubert, 4,438,076, Cl. 423-30.000.

Binks Manufacturing Company: *See*—
Garcowski, Theodore, 4,437,614, Cl. 239-691.000.

Birle, Theo. Device for self-acting limitation of speed of ascending divers. 4,437,843, Cl. 441-96.000.

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White, Claude C., 4,437,795, Cl. 405-259.000.

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Bissot, Thomas C.; Grot, Walter G.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Membrane, electrochemical cell, and electrolysis process. 4,437,951, Cl. 204-98.000.

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Koppers, Manfred; Bohnes, Karlheinz; and Kunzer, Heinz, 4,437,562, Cl. 198-733.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Prins reaction products of diisobutylene, derivatives thereof, organoleptic uses thereof and processes for preparing same. 4,437,476, Cl. 131-276.000.

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Verhagen, Laurentius A. M.; and Bodor, Janos, 4,438,149, Cl. 426-603.000.
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Ahrens, Max; and Haissig, Manfred, 4,437,509, Cl. 164-454.000.
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Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,438,143, Cl. 424-304.000.
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Deeg, Rolf; Schmitt, Urban; and Ziegenhorn, Joachim, 4,438,204, Cl. 436-67.000.
Ross, Carl H.; Kampe, Wolfgang; Bartsch, Wolfgang; Sponer, Gisbert; and Roesch, Egon, 4,438,116, Cl. 424-250.000.
Wiedemann, Fritz; Kampe, Wolfgang; Dietmann, Karl; and Sponer, Gisbert, 4,438,128, Cl. 424-273.00N.
Boeing Company, The: *See*—
Beck, Robert L. R., 4,437,387, Cl. 91-401.000.
Moorehead, James R., 4,437,627, Cl. 244-54.000.
Roize, Martin W., 4,437,629, Cl. 244-122.00R.
Boever, Jean: *See*—
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Bomer, Bruno: *See*—
Schmitz-Josten, Robert; Suling, Carlhans; Podszun, Wolfgang; Bomer, Bruno; Borgardt, Manfred; and Walkowiak, Michael, 4,437,836, Cl. 433-199.000.
Bompard, Bruno; and Bruyere, Alain, to Commissariat a l'Energie Atomique; and Societe J. Brochier & Fils. Process for inserting points in a mandrel. 4,437,221, Cl. 29-429.000.
Bon, Luigi D. Self-sealing actuating device for mounting on a discharge valve of a pressurized container. 4,437,592, Cl. 222-402.120.
Boorman, Philip M.; Chivers, Tristram; Tavares, Donald F.; and Mahadev, Kalabeerappa N., to Alberta Oil Sands Technology and Research Authority. Catalyst for sulphur removal from hydrocarbons. 4,438,218, Cl. 502-220.000.
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Ferrin, Wayne, 4,437,580, Cl. 221-75.000.
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Bitler, Joel R.; Bodnar, Michael W.; Booth, Raymond H.; Roman, Daniel J.; Schneider, Fred J.; Seitzer, Philip W.; and Wilkinson, George F., Jr., 4,437,229, Cl. 29-593.000.
Bordat, Andre, to Constructions Mecaniques de Normandie. Bevel gear power transmitting gear trains. 4,437,355, Cl. 74-385.000.
Boreal Hydraulic Equipment: *See*—
Larose, Andre, 4,437,500, Cl. 144-34.00R.
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Borsanyi, Alexander S., to American Hospital Supply Corporation. Semipermeable membrane mass transfer apparatus having slotted support members. 4,437,990, Cl. 210-321.300.
Borzym, John J. Tube cutting apparatus. 4,437,374, Cl. 83-454.000.
Bose, Sanjay K., to General Electric Company. Methods, and apparatus, for transmitting high-bit-rate digital data in power line communication media having high harmonic noise content. 4,438,519, Cl. 375-1.000.
Botteghi, Carlo; Gladiali, Serafino G.; Marchetti, Mauro; and Faedda, Giovanni A., to Consiglio Nazionale Delle Ricerche. Steroidal chiral phosphines, methods for their preparation, catalytic systems containing them and catalytic processes in which they are used. 4,438,033, Cl. 260-239.55C.
Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D., 4,437,392, Cl. 98-2.080.
Boyadjieff, George I.; and Campbell, Andrew B., to Varco International, Inc. Positioning of well pipe jack in a rig. 4,437,515, Cl. 166-77.000.
Boyadjieff, George I.; and Picard, Joseph A. R., to Varco International, Inc. Well drilling apparatus. 4,437,524, Cl. 173-43.000.
Boyle, Daniel J., to Champion International Corporation. Spool dispenser. 4,437,618, Cl. 242-71.800.
Boyt, Arthur J., Jr.: *See*—
Thornton, Marvin L.; and Boyt, Arthur J., Jr., 4,437,987, Cl. 210-137.000.
BP Chimie: *See*—
Durand, Daniel C.; and Mangin, Pierre M., 4,438,019, Cl. 502-169.000.
Bradshaw, John: *See*—
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,438,112, Cl. 424-244.000.
Brahams, Ronald Jay: *See*—
Nall, James B.; and King, Jeffery J., 4,438,227, Cl. 524-33.000.
Brakhage, William L., Jr.; and Taylor, William M., to Cameron Iron Works, Inc. Ram-type blowout preventer. 4,437,643, Cl. 251-1.00A.
Brandenburg, John T.; and Crone, John M., Jr., to Texaco Inc. Alumina catalyst stable at high temperatures. 4,438,219, Cl. 502-333.000.
Brandenstein, Manfred; and Muller, Leo, to SKF Kugellagerfabriken GmbH. Throw-out bearing for clutches, especially for motor vehicles. 4,437,556, Cl. 192-98.000.
Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Horling, Peter; Hetterich, Hermann; and Kunkel, Heinrich, 4,437,214, Cl. 29-149.5DP.
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Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,438,122, Cl. 424-263.000.
Brandl, Hans, to Siemens Aktiengesellschaft. Differential digital modulation and demodulation system with an analog signal-dependent sampling clock. 4,438,523, Cl. 375-30.000.
Brandstetter, Franz; Hambrecht, Juergen; Jung, Rudolf H.; and Lindenschmidt, Gerhard, to BASF Aktiengesellschaft. Thermoplastic molding masses of styrene-acrylonitrile and polyamide. 4,438,237, Cl. 525-183.000.
Bredow, Walter; and Otto, Gerhard, to C. Behrens AG. Tool changer for a revolving cutting press. 4,437,224, Cl. 29-568.000.
Breen, Thomas B., to General Electric Company. Selectable integrating characteristic timer for protective relays. 4,438,476, Cl. 361-96.000.
Brescia, Tony; and Deacon, Ross, to Syroco, Inc. Folding table for wall mounting. 4,437,414, Cl. 108-134.000.
Brinkley, Max D.: *See*—
Appleby, Paul E.; and Brinkley, Max D., 4,437,915, Cl. 156-126.000.
Brite, Alan D. Method of preparing an insecticide containing boric acid. 4,438,090, Cl. 424-7.100.
British Gas Corporation: *See*—
Soper, Douglas C.; and Gould, Brian, 4,437,494, Cl. 138-97.000.
British Petroleum Company Limited, The: *See*—
Kelsey, Jeffrey R., 4,437,892, Cl. 106-15.050.
Brizgys, Bernardas, to BASF Wyandotte Corporation. Tertiary alkanolamines to increase viscosity of filled liquid polymers. 4,438,235, Cl. 524-700.000.
Brocklehurst, Charles E.; and Cooper, Bruce H., to Opelika Manufacturing Corporation. Sheet material cutting method and apparatus. 4,437,369, Cl. 83-18.000.
Bronsky, Robert J.; Clark, Dennis B.; McKeen, Jeffrey A.; and Przybylski, William A., to Michigan Consolidated Gas Company. Shut-off actuating device. 4,437,347, Cl. 73-272.00R.
Brooker, Michael F. C.; McKerihen, Steven J.; Attwala, Hashmukrai D.; and Cautillo, Antonio L., to Aero Environmental Limited. Burner head. 4,437,831, Cl. 431-177.000.
Brooks, Frank W., to Flexiblast Company. Adjustable wire guide. 4,437,601, Cl. 226-199.000.
Brown, David E. Valve piston. 4,437,491, Cl. 137-540.000.
Brown, Fred A., to Rotron, Incorporated. Self-starting, direct current motor with permanent magnets of varied magnetic strength. 4,438,362, Cl. 310-152.000.
Brown, James R.; and Siroos, Karlis A. Conversion of modern shotguns into muzzleloading shotguns. 4,437,249, Cl. 42-51.000.
Brown, Paul, to Husky Injection Molding Systems Ltd. Air ejection of molded containers. 4,438,065, Cl. 264-335.000.
Brown, Robert E.: *See*—
Stevens, Perry; and Brown, Robert E., 4,437,595, Cl. 222-642.000.
Brown, Robert L., to AMF Incorporated. Gyroscopic instrument. 4,437,243, Cl. 33-302.000.
Bruno, Roberto; and Memmi, Massimo, to Zincroksid S.p.A. Process of making long-life thin metal plate for automobile bodies. 4,437,944, Cl. 204-27.000.
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Bompard, Bruno; and Bruyere, Alain, 4,437,221, Cl. 29-429.000.
Buchanan, Michael S.: *See*—
Fracalossi, Roland N.; Greenhouse, Walter V. V.; and Buchanan, Michael S., 4,438,220, Cl. 521-55.000.
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Budde, David L.; Carson, David G.; Cornish, Anthony L.; Hosler, Brad W.; Johnson, David B.; and Peterson, Craig B., to Intel Corporation. Apparatus of fault-handling in a multiprocessing system. 4,438,494, Cl. 364-200.000.
Budzich, Tadeusz, to Caterpillar Tractor Company. Priority flow control system. 4,437,307, Cl. 60-427.000.
Budzich, Tadeusz, to Caterpillar Tractor Company. Dual input pressure compensated fluid control valve. 4,437,388, Cl. 91-446.000.
Buechler, Lester W. Engraving apparatus and method. 4,438,460, Cl. 358-299.000.
Bugg, Francis V.: *See*—
Young, Alfred G.; Slocomb, Leon F., Jr.; and Bugg, Francis V., 4,438,430, Cl. 340-547.000.
Buhl, Steven N.: *See*—
Engler, Philip V.; and Buhl, Steven N., 4,438,202, Cl. 436-8.000.
Bullen, Lee, to Publishers Equipment Corporation. Reduction of cutoff length for folding mechanisms. 4,437,855, Cl. 493-424.000.
Bullock, Joseph J., III, to Three Sisters Ranch Enterprises. Overcap for spice canister. 4,437,593, Cl. 222-541.000.
Bunri Industry Co., Ltd.: *See*—
Tashiro, Minoru, 4,437,991, Cl. 210-413.000.
Burger, Walter L.: *See*—
Elias, Moenes L.; and Burger, Walter L., 4,437,931, Cl. 156-666.000.
Burgmyer, Patricia L., to Hazeltine Corporation. Dual mode blade antenna. 4,438,437, Cl. 343-770.000.

Buri, Hermann; and Karth, Beat, to Nyffeler, Corti AG. Apparatus for sealing containers. 4,437,292, Cl. 53-357.000.

Burke Company, The: *See*—
Holt, Neil L., 4,437,642, Cl. 249-175.000.

Burkett, John P.: *See*—
Vuckovich, Michael; Wright, Maynard K.; and Burkett, John P., 4,438,382, Cl. 318-744.000.

Burney, Ivan T.: *See*—
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Smith, Robert E., 4,438,327, Cl. 235-462.000.
Stitt, Robert M.; and Albaugh, Neil P., 4,438,338, Cl. 250-551.000.

Burroughs Corporation: *See*—
Volka, Lubomir J., 4,437,724, Cl. 339-143.00R.

Burroughs Wellcome Co.: *See*—
Stern, Warren C., 4,438,138, Cl. 424-330.000.
Vinegar, Ralph, 4,438,142, Cl. 424-260.000.

Burrus, Billie S.: *See*—
Harris, Lewis K.; and Burrus, Billie S., 4,437,830, Cl. 431-54.000.

Burt, Allan G.: *See*—
Whitehouse, Craig M.; Cox, Nigel; Burt, Allan G.; and Snyder, Daniel R., 4,437,859, Cl. 604-131.000.

Busch, Theodore N., to Caswell International Corporation. Dueling interactive target system. 4,437,671, Cl. 273-372.000.

Buschbom, Floyd E.; and Hansen, Glen D., to Veda, Inc. Support stand. 4,437,637, Cl. 248-163.00A.

Buschgens, Valentin: *See*—
Wittkopp, Helmut; and Buschgens, Valentin, 4,437,328, Cl. 72-110.000.

Bush, Rodney D., to Procter & Gamble Company, The. 4-Vinyl-2-methylenebutanedioic acid compounds. 4,438,246, Cl. 526-298.000.

Butler, Dean S., deceased: *See*—
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.

Butler, Donald R., to Stained Glass Overlay, Inc. Simulated stained and leaded glass windows. 4,438,165, Cl. 428-38.000.

Butler, John L.; Egan, Thomas R.; Rodberg, Kenneth; and Clark, Arthur E., to Raytheon Company. Transducer with tensioned-wire precompression. 4,438,509, Cl. 367-156.000.

Byers, Lance R., to FMC Corporation. Process for oxidizing thallium (I) to thallium (III). 4,438,089, Cl. 423-624.000.

Bykov, Anatoly P.: *See*—
Moskalik, Leonid M.; Ryadchikov, Vladimir E.; Bykov, Anatoly P.; Kulesh, Vladimir P.; Opasov, Stanislav I.; and Orlov, Anatoly A., 4,438,393, Cl. 324-83.00D.

C. Behrens AG: *See*—
Bredow, Walter; and Otto, Gerhard, 4,437,224, Cl. 29-568.000.

C.R. Bard, Inc.: *See*—
Crow, James J., 4,437,464, Cl. 128-303.140.

Cachat, John F., to Park Ohio Industries, Inc. Method and apparatus for inductively heating valve seat inserts. 4,438,310, Cl. 219-10.430.

Cain Encoder Company: *See*—
Wason, Thomas D., 4,438,434, Cl. 340-825.510.

Cais, Rudolf E., to Bell Telephone Laboratories, Incorporated. Preparation of regioregular polyfluoroethylenes and products thereof. 4,438,247, Cl. 526-249.000.

California Institute of Technology: *See*—
Rembaum, Alan; and Yen, Richard C. K., 4,438,239, Cl. 525-54.100.

Calistrat, Michael M., to Koppers Company, Inc. Flexible coupling. 4,437,847, Cl. 464-74.000.

Cameron Iron Works, Inc.: *See*—
Brakhage, William L., Jr.; and Taylor, William M., 4,437,643, Cl. 251-1.00A.

Campagnolo, Tullio. Tube structure for bicycle and motorcycle frames. 4,437,679, Cl. 280-281.00R.

Campbell, Andrew B.: *See*—
Boyadjieff, George I.; and Campbell, Andrew B., 4,437,515, Cl. 166-77.000.

Campbell, Curtis B., to Chevron Research Company. Lubricating oil compositions containing polyether polyamine ethanes. 4,438,022, Cl. 252-51.50R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Fenrick, Walter J., 4,437,337, Cl. 73-54.000.

Canada, James W.; and Layton, James W., to United States Pipe and Foundry Company. Contoured dunnage cutter. 4,437,501, Cl. 144-136.00R.

Canalizo, Carlos R., to Otis Engineering Corporation. Dewatering apparatus. 4,437,514, Cl. 166-53.000.

Canon Denshi Kabushiki Kaisha: *See*—
Hirano, Hirofumi, 4,437,776, Cl. 400-142.000.
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Goto, Hirokazu; and Abiko, Shuzo, 4,438,470, Cl. 360-113.000.

Canon Kabushiki Kaisha: *See*—
Akashi, Akira; Katsuma, Makoto; Kawamura, Masaharu; Kamata, Shigeru; and Saito, Syuichiro, 4,437,752, Cl. 354-289.000.
Ikemori, Keiji, 4,437,746, Cl. 354-479.000.
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,437,757, Cl. 355-15.000.
Momiyama, Kikuo, 4,437,735, Cl. 350-458.000.
Onoda, Shigeyoshi; and Nagaoka, Tateki, 4,437,656, Cl. 271-10.000.
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, 4,437,743, Cl. 354-402.000.
Sakurayama, Junichi; and Magome, Tamotsu, 4,437,755, Cl. 355-10.000.
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Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Goto, Hirokazu; and Abiko, Shuzo, 4,438,470, Cl. 360-113.000.
Suzuki, Akiyoshi, 4,437,758, Cl. 355-41.000.
Suzuki, Takashi; and Ito, Susumu, 4,437,740, Cl. 354-476.000.
Toyama, Masamichi, 4,437,552, Cl. 192-26.000.
Toyomura, Shigeru, 4,438,431, Cl. 340-663.000.

Cantwell, Hugh F., to Rolls-Royce Limited. Fuel control system for a gas turbine engine. 4,437,303, Cl. 60-39.281.

Capaldi, Nicholas R., to Smiths Industries Public Limited Company. Torquer assemblies for gyroscope apparatus. 4,437,354, Cl. 74-5.460.

Capitol Products Corporation: *See*—
Cribben, James T.; and Ichter, William J., 4,437,284, Cl. 52-456.000.

Carborundum Abrasive Company: *See*—
Parekh, Dhan N.; and Schweyen, Paul R., 4,437,865, Cl. 51-298.000.

Cardell, Max L., to Fiber Industries, Inc. Winding apparatus for filamentary material having means for winding a trailing end of the filamentary material in close order upon a package. 4,437,617, Cl. 242-18.0EW.

Cardinaux, Francois: *See*—
Bauer, Wilfried; Cardinaux, Francois; Huguenin, Rene; Pless, Janos; and Sandrin, Edmond, 4,438,103, Cl. 424-177.000.

Carlisle, Richard S. Hydroponic apparatus and method. 4,437,264, Cl. 47-58.000.

Carlson, Arne H. Bulge forming method and apparatus. 4,437,326, Cl. 72-62.000.

Caron, Christopher D.; and Schaefer, Donald W., to International Business Machines Corporation. Rotary drum for processing sheet materials. 4,437,659, Cl. 271-276.000.

Carr, William F.: *See*—
Dettling, Joseph C.; Carr, William F.; Heck, Ronald M.; and Chen, James M., 4,438,082, Cl. 423-235.000.

Carrier Corporation: *See*—
Ertinger, Richard E., 4,437,322, Cl. 62-504.000.

Carroll, William G.; Farley, Peter; and Marklow, Raymond J., to Imperial Chemical Industries Limited. Polymer-modified polyols. 4,438,252, Cl. 528-75.000.

Carson, David G.: *See*—
Budde, David L.; Carson, David G.; Cornish, Anthony L.; Hosler, Brad W.; Johnson, David B.; and Peterson, Craig B., 4,438,494, Cl. 364-200.000.

Cary, Hall; and Marquard, John F., to Cary, Hall, a part interest. Catenary controller. 4,437,619, Cl. 242-75.510.

Casademont, Ernest: *See*—
Sanchez, Victor; Espenan, Patrick; Casademont, Ernest; and Lafaille, J. Pierre, 4,437,967, Cl. 204-301.000.

Casale, Michael A., to Hewlett-Packard Company. Gas flow controller. 4,437,489, Cl. 137-487.500.

Casazza, Anna M.: *See*—
Suarato, Antonino; Penco, Sergio; Arcamone, Federico; and Casazza, Anna M., 4,438,105, Cl. 424-180.000.

Casey, Donald J.; and Huffman, Kenneth R., to American Cyanamid Company. Poly(glycolic acid)/poly(alkylene glycol) block copolymers and method of manufacturing the same. 4,438,253, Cl. 528-86.000.

Casillo, James H.: *See*—
Wells, Alfred E., Jr.; and Casillo, James H., 4,438,290, Cl. 136-221.000.

Casio Computer Co., Ltd.: *See*—
Ishida, Hideaki; Ishikawa, Tomohisa; Yamana, Koji; and Kayahara, Takehiko, 4,437,378, Cl. 84-1.180.
Mitarai, Tsuyoshi; and Sato, Kunio, 4,437,377, Cl. 84-1.010.

Casper, Paul W.; and Ashley, William B., to Harris Corporation. Temperature compensated avalanche photodiode optical receiver circuit. 4,438,348, Cl. 307-310.000.

Casperson, John R., to Phillips Petroleum Company. Carbon black process. 4,438,087, Cl. 423-450.000.

Castellanos Manero, Carlos E., to Aida Castellanos Kwasniak. Rapid loading device for a revolver. 4,437,252, Cl. 42-89.000.

Castiglioni, Joseph; and Rosenthal, Paul. Heat recovery apparatus. 4,437,513, Cl. 165-154.000.

Caswell International Corporation: *See*—
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Caterpillar Tractor Company: *See*—
Budzich, Tadeusz, 4,437,307, Cl. 60-427.000.
Budzich, Tadeusz, 4,437,388, Cl. 91-446.000.

Catherwood, Bayard D.: *See*—
Deftos, Leonard J.; and Catherwood, Bayard D., 4,438,208, Cl. 436-542.000.

Cautillo, Antonio L.: *See*—
Brooker, Michael F. C.; McKeriben, Steven J.; Attwala, Hashmukrai D.; and Cautillo, Antonio L., 4,437,831, Cl. 431-177.000.

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Winkley, Michael W.; and Childress, Scott J., 4,438,031, Cl. 260-112.50R.
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Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Jozsef; Kekesi, Krisztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter; and Horvath, Karoly, 4,438,132, Cl. 424-285.000.
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Boorman, Philip M.; Chivers, Tristram; Tavares, Donald F.; and Mahadev, Kalabeerappa N., 4,438,218, Cl. 502-220.000.
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Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,437,879, Cl. 71-96.000.
Hubele, Adolf; Eckhardt, Wolfgang; and Riebli, Peter, 4,438,125, Cl. 424-269.000.
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Ganci, Salvatore, 4,438,102, Cl. 424-130.000.
Citizen Watch Company Limited: *See*—
Miyasaka, Kenji, 4,437,768, Cl. 368-88.000.
Clark, Arthur E.: *See*—
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Handa, David, 4,437,333, Cl. 73-12.000.
Clemens, Donald F.: *See*—
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Richter, Simon J.; and Aykanian, Ardashus A., 4,438,061, Cl. 264-249.000.
Cockrell, Darryl W., to Baker International Corporation. Combination release mechanism for downhole well apparatus. 4,437,516, Cl. 166-120.000.
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Krinski, Thomas L.; and Coco, Charles E., 4,437,893, Cl. 106-80.000.
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Cogan, Adrian I., to GTE Laboratories Incorporated. Etched-source static induction transistor. 4,437,925, Cl. 156-653.000.
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Colby, Ronald W.; and Spicer, Arnold, to New Generation Foods, Inc. Method for preparing cooked wheat product. 4,438,146, Cl. 426-448.000.
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Combustion Engineering, Inc.: *See*—
Harris, Lewis K.; and Burrus, Billie S., 4,437,830, Cl. 431-54.000.
Commandeur, Raymond: *See*—
Mathais, Henri; Commandeur, Raymond; Pontoglio, Achille; and Nebel, Sergio, 4,438,027, Cl. 252-581.000.
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Bompard, Bruno; and Bruyere, Alain, 4,437,221, Cl. 29-429.000.
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Chambaz, Bernard; Delapierre, Gilles; and Destannes, Louis, 4,438,480, Cl. 361-278.000.
Forrat, Francis, 4,438,337, Cl. 250-436.000.
Testard, Olivier, 4,438,168, Cl. 428-193.000.
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Uzunoglu, Vasil, 4,438,355, Cl. 307-511.000.
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Londos, Rene; and Barbereau, Jean-Luc, 4,437,808, Cl. 414-667.000.
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Bolze, Georges, 4,437,885, Cl. 75-10.00R.
Compagnie Royale Asturienne des Mines: *See*—
Dreulle, Noel; Van Ceulen, Alain; and Eusebe, Claude, 4,437,965, Cl. 204-290.00F.
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Reese, Ira W.; and Compagnucci, Nello B., 4,437,213, Cl. 29-33.00K.
Connelly, William L. Portable cooking grill. 4,437,450, Cl. 126-30.000.
Connor, Terrence E. Surfing device. 4,437,842, Cl. 441-65.000.
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Wasson, George E., 4,437,982, Cl. 209-5.000.
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Botteghi, Carlo; Gladiali, Serafino G.; Marchetti, Mauro; and Faedda, Giovanni A., 4,438,033, Cl. 260-239.55C.
Constant, James N. Computer having plural IC chips with each chip including a transceiver. 4,438,491, Cl. 364-200.000.
Construction Forms, Inc.: *See*—
Bigelow, David E.; and Timmerman, Terry, 4,437,646, Cl. 251-145.000.
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Bordat, Andre, 4,437,355, Cl. 74-385.000.
Continental Group, Inc., The: *See*—
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,437,825, Cl. 425-145.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Seitz, Hans; Rach, Heinz-Dieter; Pieper, Henner; and Frerichs, Udo, 4,437,503, Cl. 152-209.00R.
Conwed Corporation: *See*—
Thomalla, Richard O., 4,438,526, Cl. 381-73.000.
Cooper, Bruce H.: *See*—
Brocklehurst, Charles E.; and Cooper, Bruce H., 4,437,369, Cl. 83-18.000.
Cooper, Gordon J., to Westinghouse Electric Corp. Electrified wall panel system. 4,437,716, Cl. 339-4.000.
Copeland, John A., III; and Miller, Stewart E., to Bell Telephone Laboratories, Incorporated. Multilayered optical integrated circuit. 4,438,447, Cl. 357-19.000.
Corbett, David F.; Southgate, Robert; and Coulton, Steven, to Beecham Group Limited. β-Lactam antibiotics their preparation and their use. 4,438,036, Cl. 260-245.20T.
Corbett, Scott S., Jr.: *See*—
Perrott, Lynn F., 4,437,807, Cl. 414-620.000.
Cordier, Jean; and Rollot, Pierre, to Union Siderurgique du Nord et de l'Est de la France. Cooling plate for blast-furnaces. 4,437,651, Cl. 266-193.000.
Cordis Corporation: *See*—
Peers-Trevarton, Charles A., 4,437,474, Cl. 128-784.000.
Saulson, Stanley H.; Schroeppel, Edward A.; and Tarjan, Peter P., 4,437,466, Cl. 128-419.0PS.
Corley, William G., to Ex-Cell-O Corporation. Single pass sizing tool and machine including wear compensation means. 4,437,267, Cl. 51-34.00R.
Cornell Research Foundation, Inc.: *See*—
Meister, Alton; and Williamson, Joanne M., 4,438,124, Cl. 424-270.000.
Cornies, Donald G.: *See*—
Pankratz, Lawrence A.; and Cornies, Donald G., 4,437,498, Cl. 141-89.000.
Corning Glass Works: *See*—
Covington, Arthur K.; and Sibbald, Alastair, 4,437,969, Cl. 204-403.000.
Miller, Roger A., 4,437,870, Cl. 65-12.000.
Rittler, Hermann L., 4,438,210, Cl. 501-4.000.
Cornish, Anthony L.: *See*—
Budde, David L.; Carson, David G.; Cornish, Anthony L.; Hosler, Brad W.; Johnson, David B.; and Peterson, Craig B., 4,438,494, Cl. 364-200.000.
Coster, Ora. Dice box. 4,437,665, Cl. 273-138.00R.
Cosworth Research and Development Limited: *See*—
Vogel, Alfredo, 4,437,834, Cl. 432-14.000.
Coulter Electronics, Inc.: *See*—
Hogg, Walter R., 4,438,390, Cl. 324-71.100.
Coulton, Steven: *See*—
Corbett, David F.; Southgate, Robert; and Coulton, Steven, 4,438,036, Cl. 260-245.20T.
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Crane and Company: *See*—
Crane, Frederick G., Jr., 4,437,935, Cl. 162-103.000.
Crane, Frederick G., Jr., to Crane and Company. Method and apparatus for providing security features in paper. 4,437,935, Cl. 162-103.000.
Cribben, James T.; and Ichter, William J., to Capitol Products Corporation. Snap-on false muntin system. 4,437,284, Cl. 52-456.000.
Crisci, Clem C. Golf club. 4,437,663, Cl. 273-81.200.
Crone, John M., Jr.: *See*—
Brandenburg, John T.; and Crone, John M., Jr., 4,438,219, Cl. 502-333.000.
Crookston, Ronald W.; and Burney, Ivan T., to Westinghouse Electric Corp. Circuit interrupter operating mechanism having a chemical operator with a stationary piston. 4,438,306, Cl. 200-148.00F.
Cross, Skip D. L. Controlled dispersion speaker configuration. 4,437,541, Cl. 181-151.000.
Crow, James J., to C.R. Bard, Inc. Electrosurgical generator safety apparatus. 4,437,464, Cl. 128-303.140.
Crowe, Talmadge L.: *See*—
Bianchi, David C.; and Crowe, Talmadge L., 4,437,517, Cl. 166-120.000.
Cruse, Bernard W., Jr.: *See*—
Collins, Michael J.; Cruse, Bernard W., Jr.; and Goetchius, Ronald J., 4,438,500, Cl. 364-567.000.
Cruse, Lee H., to Foster Manufacturing Company. Quick connect-disconnect coupling for fluid lines. 4,437,647, Cl. 251-149.900.
Csanitz, Herbert; and Weyl, Helmut, to Robert Bosch GmbH. Electrochemical oxygen sensor, particularly for exhaust gases from combustion engines. 4,437,971, Cl. 204-427.000.
Csere, Csaba; and Follmer, William C., to Ford Motor Company. Adaptive air flow meter offset control. 4,437,340, Cl. 73-118.000.
Cullen, Donald L.; and Robertson, John A., to Autech Corporation. Electrostatic transducer for length measurement system. 4,438,402, Cl. 324-452.000.
Curtis, William M.: *See*—
Slocum, Donald H.; Schairbaum, Albert W.; and Curtis, William M., 4,437,274, Cl. 52-105.000.
Cushing, David E.; and Stanley, Philip E., to Honeywell Information Systems Inc. Multiwork memory data storage and addressing technique and apparatus. 4,438,493, Cl. 364-200.000.
Daeuble, Manfred: *See*—
Oeder, Dieter; Ziegler, Walter; Daeuble, Manfred; Dietsche, Wolfram; Hettche, Albert; and Weiss, Stefan, 4,438,008, Cl. 252-56.00R.
Dahnert, Dean L., to Spacesaver Corporation. Movable storage unit controls. 4,437,711, Cl. 312-201.000.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Ishizuka, Tetsuo; Hotta, Hiroshi; and Nishimura, Yoshichika, 4,437,861, Cl. 44-1.00R.
Daimler-Benz Aktiengesellschaft: *See*—
Stolz, Albert; and Mordau, Manfred, 4,437,393, Cl. 98-2.170.
Dainichi-Nippon Cables, Ltd.: *See*—
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Daluge, Susan M.; and Skoneczny, Paul M. Monoheteroring compounds and their use. 4,438,267, Cl. 544-309.000.
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Gulliksen, John E.; Guimond, Roy A.; Daly, Charles F.; and Hamilton, William H., 4,438,483, Cl. 362-183.000.
Dangschat, Rainer, to Siemens Aktiengesellschaft. Transistor pulse drive control circuit. 4,438,345, Cl. 307-270.000.
Daniels, John Y.; and Stevenson, James C., to Springs Industries, Inc. Colored opaque printing of textile fabrics using dyestuffs. 4,438,169, Cl. 428-196.000.
Dart Industries Inc.: *See*—
Elias, Moenes L.; and Burger, Walter L., 4,437,931, Cl. 156-666.000.
Wong, Kwee C., 4,437,927, Cl. 156-666.000.
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Data General Corporation: *See*—
Kaseta, Robert G., 4,438,380, Cl. 318-696.000.
Datapoint Corporation: *See*—
Tompkins, Elliot N.; and Kline, Sherman S., 4,437,660, Cl. 271-290.000.
Datwyler, Max, to MDC Max Datwyler AG. Methods for producing printing plates, and printing plates produced thereby. 4,437,942, Cl. 204-6.000.

Davey, Ernest A.: *See*—
Hope, Lawrence L.; and Davey, Ernest A., 4,437,966, Cl. 204-298.000.
Davis, Steven J., to Power Spectra, Inc. Bulk semiconductor switch. 4,438,331, Cl. 250-211.00J.
Davis, Walter G., to NesTier Corporation. Removable poultry nest bottoms of variable widths. 4,437,434, Cl. 119-45.00R.
Davy McKee Aktiengesellschaft: *See*—
Moderlak, Helmut; Koschinek, Gunter; Zinsser, Rolf; Prehler, Richard; and Kretschmann, Bernd, 4,437,827, Cl. 425-378.00S.
Day Mixing Company: *See*—
Hargis, Richard A., 4,437,767, Cl. 366-287.000.
Dayco Corporation: *See*—
Howerton, Anderson W.; and Foley, Mark P., 4,437,371, Cl. 83-54.000.
DBS, Inc.: *See*—
Barbour, William P., 4,437,404, Cl. 101-269.000.
Deacon, Ross: *See*—
Brescia, Tony; and Deacon, Ross, 4,437,414, Cl. 108-134.000.
DeBardeleben, Martha G. Method and apparatus for training cats to use a toilet bowl. 4,437,430, Cl. 119-1.000.
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Deeg, Rolf; Schmitt, Urban; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Determination of glycosilated hemoglobin. 4,438,204, Cl. 436-67.000.
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Koning, Richard W., 4,437,399, Cl. 100-4.000.
Kramer, Kenneth D.; and Fletcher, Edward H., 4,437,385, Cl. 91-361.000.
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Deis, Daniel W.; and Kemeny, George A., to Westinghouse Electric Corp. Muzzle arc suppressor for electromagnetic projectile launcher. 4,437,383, Cl. 89-8.000.
Dejoux, Andre; and Desnoulez, Bruno. Wine waiter's corkscrews. 4,437,359, Cl. 81-3.38A.
Delaey, Lucas J., to Leuven Research & Development V.Z.W. Beta alloys with improved properties. 4,437,911, Cl. 148-402.000.
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Chambaz, Bernard; Delapierre, Gilles; and Destannes, Louis, 4,438,480, Cl. 361-278.000.
DelGreco, Angela G.; Allen, Malcolm L.; and Jacobsen, Ronald L., to Procter & Gamble Company, The. Stable liquid detergent compositions. 4,438,024, Cl. 252-545.000.
Della-Moretta, Leonard B. Adjustable two-bar linkage for a four-wheel trailer. 4,437,680, Cl. 280-460.00R.
Delphi Dental Industries B.V.: *See*—
van der Zel, Joseph M.; and de Groot, Klaas, 4,437,191, Cl. 3-1.000.
Delta Dredge and Pump Corporation: *See*—
Kalbac, John F., 4,437,814, Cl. 417-351.000.
Delta Kogyo Co., Ltd.: *See*—
Nishikori, Tsutomu; and Yoshiki, Yasuo, 4,437,703, Cl. 297-362.000.
Delta Limited: *See*—
Geppelt, Elmo W.; and Poore, William H., 4,437,329, Cl. 72-299.000.
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DeVore, Robert F., to Harsco Corporation. Heat exchanger assembly. 4,437,512, Cl. 165-122.000.
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Doev, Vitaly S.; Kotelyansky, Iosif M.; Kravchenko, Valery B.; Monosov, Yakov A.; Shakhunov, Valery A.; and Kopylov, Jury L., to Institut Radiotekhniki I Elektroniki Akademii Nauk SSSR. Method of recording information on a medium in the form of electrical signals. 4,438,443, Cl. 346-153.100.
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Dore, Jacques, to Automobiles Citroen; and Automobiles Peugeot. Universal transmission coupling and a process for manufacturing such a coupling. 4,437,331, Cl. 72-360.000.
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Dorpmund, Willi, to Graaff KG. Device for locking together stacked objects. 4,437,211, Cl. 24-287.000.
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Doyle, Richard H. Mounting apparatus for a dirt bike. 4,437,597, Cl. 224-42.45R.
Drath, Edwin H. High pressure hose swivel connector. 4,437,690, Cl. 285-272.000.
Drealle, Noel; Van Ceulen, Alain; and Eusebe, Claude, to Compagnie Royale Asturienne des Mines. Reinforced lead anode for the electrolytic production of zinc from sulphate solution and process for the preparation thereof. 4,437,965, Cl. 204-290.00F.
Drews, Ulrich; Rapps, Peter; and Werner, Peter, to Robert Bosch GmbH. Linearizing and control circuit for air flow rate meter. 4,437,339, Cl. 73-118.000.
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Durand, Francois; and Smulders, Auguste, to Societe Anonyme Engrenages et Reducteurs. Vertically moving platform supported on legs. 4,437,792, Cl. 405-198.000.
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,438,127, Cl. 424-272.000.
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Dyer, David; and Wise, James L., to Technology Marketing Inc. Method and apparatus for recovering waste energy. 4,437,316, Cl. 62-79.000.
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von Branchel, Helmut; Schreiber, Georg; and Schroeder, Heinz, 4,438,075, Cl. 422-189.000.
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Eaby, Daniel G.; Long, William B.; and Shuey, John R., to AMP Incorporated. Junction connections for modular wiring systems. 4,437,725, Cl. 339-156.00R.
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Eguchi, Osamu; and Fukui, Tomonori, to Nippondenso Co., Ltd. Air condition control apparatus with indoor and outdoor air selection modes for automobiles. 4,437,391, Cl. 98-2.010.
Eguchi, Takeo: *See*—
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Ehgartner, Gabriele; and Vondrovsky, Gabriel, to Agfa-Gevaert AG. Film transporting arrangement for cameras. 4,437,749, Cl. 354-214.000.
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Ekdahl, Carl A., to United States of America, Energy. Capacitively-coupled inductive sensor. 4,438,394, Cl. 324-126.000.
Eklund, Claes E. Transporter air chiller. 4,437,320, Cl. 62-236.000.
Elaschuk, John T. Collapsible or folding chair. 4,437,700, Cl. 297-45.000.
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Elias, Luis R.; Madey, John M. J.; and Smith, Todd I., to United States of America, Navy. Short wavelength free electron laser using low energy electrons. 4,438,513, Cl. 372-2.000.
Elias, Moenes L.; and Burger, Walter L., to Dart Industries Inc. Dissolution of metals. 4,437,931, Cl. 156-666.000.
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Elliott, Robert H., Jr., to Zerpol Corporation. Boiler apparatus. 4,437,968, Cl. 204-301.000.
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Halfaker, Thomas C., 4,437,287, Cl. 52-588.000.
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Emerson, Ralph W., Sr., to Plasmine Corporation, The. Sizing compositions containing a formic acid salt, processes, and paper sized with the compositions. 4,437,894, Cl. 106-238.000.
Enander, Frederick A. Ultrasonic control of filling a container. 4,437,497, Cl. 141-1.000.
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Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, 4,437,883, Cl. 75-0.50C.
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Engelsmann, Dieter; Hackenberg, Hubert; Lermann, Peter; Wagner, Karl; and Zobel, Siegfried, to Agfa-Gevaert AG. Film transport arrangement with perforation wheel for camera. 4,437,751, Cl. 354-214.000.
Engler, Philip V.; and Buhl, Steven N., to Technicon Instruments Corporation. Stable, base serum compositions and preparation thereof. 4,438,202, Cl. 436-8.000.
Erdman, Victor B., to Victory Equipment Limited. Draper pick-up tine. 4,437,296, Cl. 56-400.000.
Erickson, Bruce W.; and Hugli, Tony E., to Research Corporation. Synthetic peptides. 4,438,029, Cl. 260-112.50R.
Erickson, Frederick L. Dual-expansion internal combustion cycle and engine. 4,437,437, Cl. 123-42.000.
Erickson, Roger D., to Honeywell Inc. Electrographic recording apparatus with delayed paper drive termination. 4,438,442, Cl. 346-153.100.
Ertinger, Richard E., to Carrier Corporation. Heat exchanger assembly for a refrigeration system. 4,437,322, Cl. 62-504.000.
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Fan, Liang-tseng; and Hsu, Edward H., to Kansas State University Research Foundation. Method of filtration using semifluidized beds. 4,438,000, Cl. 210-786.000.
Fancey, Everett G.; Peters, John V.; and Tucker, Russell E., to Nordco Limited. Longline baiting. 4,437,254, Cl. 43-4.000.
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Favin, David L., to Bell Telephone Laboratories, Incorporated. Adaptive techniques for automatic frequency determination and measurement. 4,438,504, Cl. 364-724.000.
Fawkes, John S.; and Umholtz, Walter F., to Ampex Corporation. D.C. Controlled adjustable ramp signal generator and method. 4,438,466, Cl. 360-66.000.
FBC Limited: *See*—
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Fenrick, Walter J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Viscoelastometer. 4,437,337, Cl. 73-54.000.
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Filippos, Makram I. Swimming wheel apparatus. 4,437,840, Cl. 440-27.000.
Finike Italiana Marposs S.p.A.: *See*—
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Finley, Joseph H.; and Liao, Hsiang P., to FMC Corporation. Process for the manufacture of mixed phosphoric acid ester compositions. 4,438,048, Cl. 260-982.000.
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Schulte-Elte, Karl H.; Snowden, Roger L.; and Muller, Bernard L., 4,438,283, Cl. 568-403.000.
Skorianetz, Werner; and Ohloff, Gunther, 4,438,023, Cl. 252-522.00R.
Fischer, Artur. Mounting element for mounting object to support structure. 4,437,804, Cl. 411-59.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary printing machine system with optional continuous web printing. 4,437,402, Cl. 101-181.000.
Fischer, Victor H., to Thermal Systems Limited. Rotary heat engine. 4,437,308, Cl. 60-514.000.
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Cawley, James C.; DiMartino, Michael D.; Fisher, Thomas J.; King, Roger L.; and Uhler, Marcus H., 4,438,473, Cl. 361-18.000.
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Fletcher, Edward H.: *See*—
Kramer, Kenneth D.; and Fletcher, Edward H., 4,437,385, Cl. 91-361.000.
Flexiblast Company: *See*—
Brooks, Frank W., 4,437,601, Cl. 226-199.000.
Fling, George K., to Vought Corporation. Fluid sealing devices. 4,437,674, Cl. 277-188.00A.
Flint, David L. Apparatus for controlling and releasing pressure of a tool on a workpiece. 4,437,376, Cl. 83-886.000.
Flow Industries, Inc.: *See*—
O'Hanlon, Tom A.; Madonna, Peter L.; and Wallace, Gearld F., 4,437,525, Cl. 175-218.000.
Fluid Operations & Equipment, Inc.: *See*—
Wingate, Clarence W., 4,437,686, Cl. 285-12.000.
FMC Corporation: *See*—
Byers, Lance R., 4,438,089, Cl. 423-624.000.
Finley, Joseph H.; and Liao, Hsiang P., 4,438,048, Cl. 260-982.000.
McEuen, Bruce K.; and Norris, Robert D., 4,438,080, Cl. 423-112.000.
Foissac, Yves; and Hung, Frederic N. B., to Laboratoire d'Etudes et de Recherches Chimiques L.E.R.C. Lattice-type structure, particularly mast support of antenna. 4,437,288, Cl. 52-637.000.
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Howerton, Anderson W.; and Foley, Mark P., 4,437,371, Cl. 83-54.000.
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Rubin, Michael D.; and Ho, Pang T., 4,438,411, Cl. 330-289.000.
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Ammons, Edward A., 4,438,049, Cl. 261-42.000.
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Joy, Robert D., 4,437,349, Cl. 73-861.220.
Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; Fozo, Steven R.; and Kern, Glenn A., 4,438,497, Cl. 364-431.050.
Forrat, Francis, to Commisariat a l'Energie Atomique. Apparatus for the purification of water by ultraviolet radiation. 4,438,337, Cl. 250-436.000.
Forrest, Gordon C., to Technicon Instruments Corporation. Test-tube assembly for immunoassays utilizing magnetically attractable particles. 4,438,068, Cl. 422-61.000.
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Banke, Karl-Heinz; Hering, Elisabeth; Lobel, Wilfried; Pollack, Dieter; Wiedemann, Gunter; Grell, Ute; and Schuler, Ingo, 4,438,053, Cl. 264-25.000.

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Taubman, Martin A.; and Smith, Daniel J., 4,438,200, Cl. 435-193.000.

Fortin, Paul; Michaud, Paul; and Pernicka, Martin, to Poudrier Frere Ltee. Control system for cage supported by articulated boom. 4,437,543, Cl. 182-2.000.

Fory, Werner; Martin, Henry; and Pissiotas, Georg, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,437,879, Cl. 71-96.000.

Foseco Trading A.G.: *See*—
Dunkelmann, Dietger; Jaunich, Helmut; and Schiffarth, Josef, 4,438,515, Cl. 373-88.000.

Foshee, William R., to Best Lock Corporation. Knob retainer blocker mechanism. 4,437,695, Cl. 292-352.000.

Foster, Kenneth J., to Econ Incorporated. Thermal insulation structure for windows. 4,437,277, Cl. 52-202.000.

Foster Manufacturing Company: *See*—
Cruse, Lee H., 4,437,647, Cl. 251-149.900.

Fox, Hugh M.; and Sutcliffe, Peter H. Output processing system for a digital electronic musical instrument. 4,438,502, Cl. 364-718.000.

Fozo, Steven R.: *See*—
Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; Fozo, Steven R.; and Kern, Glenn A., 4,438,497, Cl. 364-431.050.

Fracalossi, Roland N.; Greenhouse, Walter V. V.; and Buchanan, Michael S., to Wm. T. Burnett & Co., Inc. Polyurethane foam-filled foam resistant to combustion and method of producing same. 4,438,220, Cl. 521-55.000.

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Fralish, Mark R., to Ingersoll Equipment Co., Inc. Detachable hinge assembly. 4,437,529, Cl. 180-69.00C.

Fram Corporation: *See*—
Hutchins, Charles K.; Thornton, Donald I.; and Peyton, Richard H., 4,437,986, Cl. 210-130.000.

Frama AG: *See*—
Haug, Werner, 4,437,405, Cl. 101-349.000.

Frank, Wolfram: *See*—
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

FranRica Mfg. Inc.: *See*—
Rica, Albert F.; Hay, Lloyd F.; Heron, John R.; Webber, John R.; and Rechtsteiner, Steven A., 4,437,315, Cl. 62-63.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Riecke, Wolfgang D., 4,438,336, Cl. 250-398.000.

Freeman Chemical Corporation: *See*—
Nothnagel, Joseph L., 4,438,072, Cl. 422-133.000.

Freeman Industries, Inc.: *See*—
Freeman, Jonathan P., 4,437,957, Cl. 204-147.000.

Freeman, Jonathan P., to Freeman Industries, Inc. Cathodic or anodic protection system and method for independently protecting different regions of a structure. 4,437,957, Cl. 204-147.000.

Frentzel, Richard L., to Celotex Corporation, The. Metal catalyzed preparation of polyoxyalkylene surfactants for phenolic foam stabilization. 4,438,018, Cl. 252-356.000.

Frerichs, Udo: *See*—
Seitz, Hans; Rach, Heinz-Dieter; Pieper, Henner; and Frerichs, Udo, 4,437,503, Cl. 152-209.00R.

Freymond, Pierre, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Spin-stabilized sabot projectile for overcoming a heterogeneous resistance. 4,437,409, Cl. 102-364.000.

Frick Company: *See*—
Ingram, Walter B., 4,437,813, Cl. 417-53.000.

Frick, Raymond: *See*—
Schwartz, Jeremy; and Frick, Raymond, 4,437,822, Cl. 418-122.000.

Frick, Richard H.: *See*—
Sigl, Wayne C.; and Frick, Richard H., 4,437,860, Cl. 604-385.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Arens, Egidius; Hampe, Christoph; Karlowsky, Ingo; Meyersieck, Manfred; Schwarz, Hans D.; Anding, Norbert; and Leisterer, Reinhard, 4,438,438, Cl. 343-451.000.

Friedrich, Ludwig: *See*—
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

Friedrich, Ralph S.: *See*—
Magarian, Gerald M.; and Friedrich, Ralph S., 4,437,616, Cl. 242-7.020.

Friedrich Wilh. Schwing GmbH: *See*—
Metzelder, Wolfgang, 4,437,817, Cl. 417-507.000.

Frischen, Franz. Method of producing sheathed cables and/or transducers and a device for carrying out this method. 4,437,914, Cl. 156-54.000.

Frohberger, Paul-Ernst: *See*—
Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,438,122, Cl. 424-263.000.

Fuini, Dennis L.: *See*—
Newton, Charles L.; and Fuini, Dennis L., 4,437,312, Cl. 60-648.000.

Fuji Electric Company, Ltd.: *See*—
Shimatani, Michiro; and Kazama, Toyoki, 4,438,188, Cl. 430-128.000.

Fuji Photo Film Co., Ltd.: *See*—
Kitajima, Masao; Seshimoto, Osamu; Kubotera, Kikuo; and Yamaguchi, Akira, 4,437,970, Cl. 204-412.000.
Satomura, Masato, 4,438,245, Cl. 526-286.000.
Tabei, Masatoshi, 4,438,455, Cl. 358-44.000.
Teraoka, Masanori; Komaki, Takao; and Matsumoto, Seiji, 4,438,333, Cl. 250-327.200.
Umemura, Shizuo; Matsufuji, Akihiro; Aonuma, Masashi; Kitamoto, Tatsuji; and Miyatsuka, Hajime, 4,437,882, Cl. 75-0.50R.

Fujii, Tokuo: *See*—
Gaino, Mitsunori; Iijima, Ikuo; Nishimoto, Shigeru; Ikeda, Kuichiro; and Fujii, Tokuo, 4,438,035, Cl. 260-239.30B.

Fujimori, Yoshitugu; Takabori, Yasuo; Sakaso, Hajime; and Ito, Akitoshi, to Sumitomo Naugatuck Co., Ltd.; and Honda Motor Co., Ltd. Thermoplastic composition. 4,438,229, Cl. 524-109.000.

Fujinami, Shosaku: *See*—
Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,437,416, Cl. 110-245.000.

Fujisawa, Haruhiko: *See*—
Kamei, Hideaki; Yamanaka, Kazuhiko; Fujisawa, Haruhiko; and Oda, Shinichiro, 4,438,468, Cl. 360-92.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,438,113, Cl. 424-246.000.
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, 4,438,126, Cl. 424-272.000.

Fujita, Fumio: *See*—
Murase, Ichiki; Fujita, Fumio; Ohnishi, Toshihiro; and Tamura, Toshifumi, 4,438,262, Cl. 536-43.000.

Fujita, Takeshi: *See*—
Kawamatsu, Yutaka; and Fujita, Takeshi, 4,438,141, Cl. 424-248.510.

Fujitsu Limited: *See*—
Miura, Kenichi, 4,438,427, Cl. 340-347.0DD.
Oshiki, Mitsumasa; and Kawakami, Susumu, 4,438,471, Cl. 360-125.000.

Fujiu, Takamitsu; Ogino, Makoto; Kariya, Michio; and Ichimura, Takeo, to Nippon Kogaku K.K. Implants of biologically active glass or glass ceramic containing titania. 4,437,192, Cl. 3-1.900.

Fukagawa, Yasuo: *See*—
Kubo, Katsuro; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,438,201, Cl. 435-228.000.

Fukao, Masami: *See*—
Suzukamo, Gohfu; Tamura, Mitsuhisa; and Fukao, Masami, 4,438,286, Cl. 568-840.000.

Fukui, Tomonori: *See*—
Eguchi, Osamu; and Fukui, Tomonori, 4,437,391, Cl. 98-2.010.

Fukui, Yutaka; and Kashimura, Tetsuo, to Hitachi, Ltd. Cobalt base alloy. 4,437,913, Cl. 148-408.000.

Fukuoka, Tatsuhiko: *See*—
Nozue, Shigehiro; Fukuoka, Tatsuhiko; and Sugiura, Hideaki, 4,437,215, Cl. 29-149.50R.

Fukuroi, Takeo, to Yoshida Kogyo K.K. Bridge top stop for slide fasteners. 4,437,210, Cl. 24-435.000.

Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Ogawa, Tadatoshi; Kotani, Kozo; and Hosono, Hidekazu, to Sumitomo Chemical Company, Limited. Low density copolymer composition of two ethylene-α-olefin copolymers. 4,438,238, Cl. 525-240.000.

Funk, Gary L., to Phillips Petroleum Company. Control of a catalytic cracking unit. 4,437,977, Cl. 208-113.000.

Furuichi, Katsushi: *See*—
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.

Furukawa, Mitsuhiki; Miyahara, Michito; Kitahira, Takashi; Misumi, Kiyohito; Shiroyama, Masaharu; and Wada, Toshiaki, to Nippon Tungsten Co., Ltd.; and Sumitomo Special Metals Co., Ltd. Magnetic head slider material and method for producing the same. 4,438,213, Cl. 501-92.000.

Furukawa, Takashi; and Endo, Michio, to Nippon Steel Corporation. Method for producing two-phase hot rolled steel sheet having high strength and low yield ratio. 4,437,903, Cl. 148-12.00F.

Fusco, John A., deceased: *See*—
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.

Fushida, Akira; and Kato, Yoshiaki, to Mita Industrial Co. Ltd. Photosensitive composition for electrophotography with chloronaphthoquinones. 4,438,187, Cl. 430-81.000.

Futaba Denki Kogyo Kabushiki Kaisha: *See*—
Kawai, Keiichi, 4,437,397, Cl. 99-533.000.

Futamoto, Masaaki: *See*—
Hosoki, Shigeyuki; Futamoto, Masaaki; Kawabe, Ushio; Ishitani, Tohru; and Tamura, Hifumi, 4,438,371, Cl. 315-111.810.

Gaida, Wolfram: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Gaida, Wolfram; and Hoefke, Wolfgang, 4,438,118, Cl. 424-251.000.

Gaino, Mitsunori; Iijima, Ikuo; Nishimoto, Shigeru; Ikeda, Kuichiro; and Fujii, Tokuo, to Tanabe Seiyaku Co., Ltd. Method of preparing benzothiazepine derivatives. 4,438,035, Cl. 260-239.30B.

Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Jozsef; Kekesi, Krisztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter;

and Horvath, Karoly, to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt. 4-Ozo-PGI$_2$ compounds, their use in inhibition of thrombii and their production. 4,438,132, Cl. 424-285.000.

Gammill, Ronald B., to Upjohn Company, The. Antiatherosclerotic furochromones. 4,438,274, Cl. 549-387.000.

Ganci, Salvatore, to Ciro's Touch, Ltd. Method of promoting tissue growth. 4,438,102, Cl. 424-130.000.

Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Young, Rodney C., 4,438,127, Cl. 424-272.000.

Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., to Du Pont de Nemours, E. I., and Company. Antibodies to immunogenic peptides and their use to purify human fibroblast interferon. 4,438,030, Cl. 260-112.50R.

Ganster, Otto: *See*—
Grogler, Gerhard; Ganster, Otto; and Recker, Klaus, 4,438,250, Cl. 528-66.000.

Gantwerker, Scott; and Leong, Sai, to Quaker Oats Company, The. Process for preparing an instant baby cereal porridge product. 4,438,150, Cl. 426-625.000.

Garcowski, Theodore, to Binks Manufacturing Company. Electrostatic air atomization spray coating system. 4,437,614, Cl. 239-691.000.

Garner, Albert Y., to Monsanto Company. Process for preparing lactam magnesium halides. 4,438,034, Cl. 260-239.30R.

Garoffolo, Frank, to Aviatec, Inc. Boom rack for handling and positioning cargo tie down equipment. 4,437,573, Cl. 212-263.000.

Garrett Corporation, The: *See*—
Morison, Rodney, 4,438,364, Cl. 310-328.000.

Gartside, Robert J.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., 4,437,979, Cl. 208-153.000.

Gates, Donald C., to Antares Engineering, Inc. Gauge and method of determining the existence of irregularities in a surface of an article. 4,437,335, Cl. 73-37.900.

Gaul, David J.; Hinze, Jay W.; and Perkins, Richard A., to Owens-Corning Fiberglas Corporation. Method for protecting forming bushings. 4,438,518, Cl. 373-39.000.

Gawel, Len J.: *See*—
Grimsley, R. Leroy; and Gawel, Len J., 4,437,794, Cl. 405-224.000.

Gehring, Gerhard, to Siemens Aktiengesellschaft. Device for changing the electrical circuit configuration of integrated semiconductor circuits. 4,438,347, Cl. 307-308.000.

Geiler, Volkmar: *See*—
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,438,211, Cl. 501-65.000.

Geissler, Ulrich; and Herwig, Walter, to Hoechst Aktiengesellschaft. Radiation-polymerizable mixture and photopolymerizable copying material prepared therefrom. 4,438,189, Cl. 430-280.000.

Geisthoff, Hubert, to Jean Walterscheid GmbH. Freewheeling clutch assembly. 4,437,553, Cl. 192-46.000.

Geisthoff, Hubert, to Jean Walterscheid GmbH. Splined hub assembly for connecting two shafts. 4,437,782, Cl. 403-13.000.

Geke, Jurgen: *See*—
Drosdziok, Hermann; Geke, Jurgen; and Germscheid, Hans G., 4,437,898, Cl. 148-6.15R.

Gellert, Jobst U. Tubular elongated injection molding electric heating element with spacer clips. 4,438,325, Cl. 219-536.000.

General Electric Company: *See*—
Beers, Melvin D.; and Surprenant, Richard P., 4,438,039, Cl. 260-429.500.
Bose, Sanjay K., 4,438,519, Cl. 375-1.000.
Breen, Thomas B., 4,438,476, Cl. 361-96.000.
Collins, Arthur K.; Andrews, Edward W.; and Srinivasan, Nallaswamy, 4,438,495, Cl. 364-414.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,438,158, Cl. 427-101.000.
Eichelberger, Charles W.; Wojnarowski, Robert J.; and Auerbach, Abraham, 4,438,291, Cl. 136-236.00R.
Ferraro, Angelo, 4,438,486, Cl. 363-56.000.
Harnden, John D., Jr.; and Kornrumpf, William P., 4,438,396, Cl. 324-127.000.
Hershberger, Doran D., 4,437,325, Cl. 68-23.700.
Jenkins, Thomas E., 4,437,715, Cl. 312-348.000.
Liu, Ping Y., 4,438,231, Cl. 524-161.000.
Madden, James A., 4,437,327, Cl. 72-94.000.
Mark, Victor; and Hedges, Charles V., 4,438,241, Cl. 525-444.000.
McHugh, James D., 4,438,339, Cl. 290-1.00R.
Nutter, Norman E., 4,437,809, Cl. 415-41.000.
Rosenquist, Niles R.; and Lee, Garland G., 4,438,234, Cl. 524-378.000.
Rosenquist, Niles R., 4,438,255, Cl. 528-176.000.
Taber, Bruce D.; and Wagner, James B., 4,437,313, Cl. 60-665.000.
Tassie, Douglas P., 4,437,384, Cl. 89-37.00A.
Varnovitsky, Marlen, 4,438,376, Cl. 318-78.000.

General Equipment Manufacturers: *See*—
Maxwell, Ronald M., 4,437,411, Cl. 108-1.000.

General Foods Corporation: *See*—
O'Rourke, Joseph D.; and Katcher, Jay H., 4,438,148, Cl. 426-579.000.

General Microwave Corporation: *See*—
Hopfer, Samuel, 4,438,415, Cl. 333-81.00A.

General Motors Corporation: *See*—
Winchell, Frank J.; and Winkelmann, Klaus O., 4,437,535, Cl. 180-215.000.

General Tire & Rubber Company, The: *See*—
Griffith, Richard M.; and Shanoski, Henry, 4,438,062, Cl. 264-255.000.

Genshi-Ryoku Daiko Co., Ltd.: *See*—
Nagatsuka, Kenichi, 4,437,202, Cl. 15-320.000.

Gentry, Bobby C., to Southwire Company. Method and apparatus for improved heat treatment of aluminum alloy rod. 4,437,901, Cl. 148-11.50A.

Geodate Limited: *See*—
De Sa, Alten J. A., 4,438,389, Cl. 324-52.000.

Geppelt, Elmo W.; and Poore, William H., to Delta Limited. Method of manufacturing twisted tubes. 4,437,329, Cl. 72-299.000.

Gerety, Robert J.: *See*—
Tabor, Edward; and Gerety, Robert J., 4,438,098, Cl. 424-89.000.

Gerhardus, Ulrich: *See*—
Gorris, Rainer; Hibbel, Josef; Gerhardus, Ulrich; and Scheve, Heinrich, 4,437,864, Cl. 48-62.00R.

Germscheid, Hans G.: *See*—
Drosdziok, Hermann; Geke, Jurgen; and Germscheid, Hans G., 4,437,898, Cl. 148-6.15R.

Gerphagnon, Jean-Louis; and Wolter, Claude, to Aluminium Pechiney. Assembly for spot feeding alumina to an electrolytic tank for the production of aluminum. 4,437,964, Cl. 204-245.000.

Gerpheide, George E.: *See*—
Armantrout, Robert J.; Gerpheide, George E.; and Wilson, Robert F., deceased, 4,437,672, Cl. 273-185.00B.

Gesellschaft fur Biotechnologische Forschung mbH: *See*—
Lindorfer, Walter; Wagner, Fritz; and Schulz, Walther, 4,437,993, Cl. 210-631.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Redder, Manfred; Linke, Horst; Grundken, Dieter; and Temme, Helmut, 4,437,564, Cl. 198-834.000.
Stoltefuss, Wilhelm, 4,437,708, Cl. 299-81.000.

Giannone, Charles, to Duro-Dyne Corporation. Weld pin applicator device having automatic reload. 4,438,314, Cl. 219-98.000.

Gibbs, Richard B. Suitcase. 4,437,549, Cl. 190-109.000.

Gibson, Donald L.: *See*—
Liu, Henry; Gibson, Donald L.; Cheng, David H. S.; and Rathke, James E., 4,437,799, Cl. 406-16s.000.

Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., to Mobil Oil Corporation. Manufacture of lube base stock oil. 4,437,975, Cl. 208-87.000.

Gilloon, Elinor: *See*—
Schnettler, Shirley I.; and Gilloon, Elinor, 4,437,837, Cl. 434-178.000.

Gilroy, Alfred A., to MacMillan Bloedel Limited. Self protecting spray nozzle. 4,437,611, Cl. 239-453.000.

Gimmler, Joachim; and Schoder, Bernd, to Fichtel & Sachs AG. Hydrodynamic torque converter. 4,437,551, Cl. 192-3.280.

Ginley, David S.: *See*—
Baughman, Richard J.; and Ginley, David S., 4,438,183, Cl. 429-111.000.

Gipelec: *See*—
Chenaux, Bernard, 4,438,184, Cl. 429-181.000.

GK Technologies, Incorporated: *See*—
Kasiewicz, Allen B., 4,437,789, Cl. 405-156.000.

Gladdish, Peter: *See*—
McCormick, Michael A.; and Gladdish, Peter, 4,438,406, Cl. 328-167.000.

Gladiali, Serafino G.: *See*—
Botteghi, Carlo; Gladiali, Serafino G.; Marchetti, Mauro; and Faedda, Giovanni A., 4,438,033, Cl. 260-239.55C.

Glaxo Group Limited: *See*—
Collington, Eric W.; Hallett, Peter; and Wallis, Christopher J., 4,438,111, Cl. 424-246.000.
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,438,112, Cl. 424-244.000.
Grew, Edward L.; and Wilson, Nigel D. V., 4,438,046, Cl. 260-501.150.

Glenn, Thomas J.; and Kaye, Wilbur I., to Beckman Instruments, Inc. Control of detector gain hysteresis in a single beam spectrophotometer. 4,437,762, Cl. 356-326.000.

Gliemeroth, Georg: *See*—
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,438,211, Cl. 501-65.000.

Gloor, Peter, to Hilti Aktiengesellschaft. Milling tool for forming recesses in masonry, concrete and similar material structures. 4,437,526, Cl. 175-346.000.

Gluck, David G.; and Barry, Leon F., to Celotex Corporation, The. Structural laminate and method for making same. 4,438,166, Cl. 428-113.000.

Glynn, Michael H., to Sabre Safety Limited. Breathing apparatus. 4,437,460, Cl. 128-204.260.

Go-Jo Industries, Inc.: *See*—
Potter, Charles, 4,437,589, Cl. 222-327.000.

Godec, Maksimilijan, to Von Duprin, Inc. Thermally responsive latching device and method of modifying a latching device. 4,437,693, Cl. 292-191.000.

Goebel, Mark B.; and Lefebvre, Kenneth E., to Titeflex Corporation. Reusable end fitting. 4,437,689, Cl. 285-246.000.

Goetchius, Ronald J.: *See*—
Collins, Michael J.; Cruse, Bernard W., Jr.; and Goetchius, Ronald J., 4,438,500, Cl. 364-567.000.

Goff, Willie, Jr.; and Jenkins, William M., to International Business Machines Corporation. Replaceable ribbon cartridge. 4,437,779, Cl. 400-208.000.

Gogniat, Paul, to Montres Rado S.A. Timepiece. 4,437,770, Cl. 368-294.000.

Goineau, Andre M.: *See*—
Eschenbach, Paul W.; and Goineau, Andre M., 4,437,301, Cl. 57-289.000.

Gold- und Silber-Scheideanstalt Oberstein Franz Reischauer: *See*—
Stahl, Juergen; Schuster, Wilhelm; and Wegner, Wilhelm, 4,437,212, Cl. 24-698.000.

Goldberg, Jurgen. Method and device for the performance of a supporting function in a passage. 4,437,276, Cl. 52-125.500.

Golde, David W.; and Quan, Shirley G., to University of California, The Regents of the. Unique T-lymphocyte line and products derived therefrom. 4,438,032, Cl. 260-112.00R.

Goldstein, Joel; and Abrevaya, Albert, to Aquarium Pharmaceuticals, Inc. Animal litter. 4,437,429, Cl. 119-1.000.

Goldstein, Seth; and Jones, Robert, to United States of America, Health and Human Services. Method and apparatus for traversing blood vessels. 4,437,857, Cl. 604-53.000.

Gonzalez, Mikel: *See*—
Bardina, Juan; and Gonzalez, Mikel, 4,437,479, Cl. 134-68.000.

Goodman, Robert B., to United Technologies Corporation. Check valve. 4,437,485, Cl. 137-220.000.

Goodyear Tire & Rubber Company, The: *See*—
Appleby, Paul E.; and Brinkley, Max D., 4,437,915, Cl. 156-126.000.
D'Sidocky, Richard M., 4,438,289, Cl. 585-827.000.

Gorman, Richard M. Full gain twist ratchet rifling. 4,437,251, Cl. 42-78.000.

Gorris, Rainer; Hibbel, Josef; Gerhardus, Ulrich; and Scheve, Heinrich, to Karrena GmbH; Ruhrchemi AG; and Ruhrkohle AG. Plant with a reactor container, particularly for the gasification of fossil fuels. 4,437,864, Cl. 48-62.00R.

Gosso, Giancarlo: *See*—
Stabile, Nicolo; Motta, Raimondo; and Gosso, Giancarlo, 4,438,276, Cl. 560-13.000.

Goto, Hirokazu: *See*—
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Goto, Hirokazu; and Abiko, Shuzo, 4,438,470, Cl. 360-113.000.

Goto, Tokuju: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,437,324, Cl. 68-5.00E.

Gottlieb, Norman: *See*—
Williams, Albert V., 4,437,518, Cl. 166-248.000.

Gould, Brian: *See*—
Soper, Douglas C.; and Gould, Brian, 4,437,494, Cl. 138-97.000.

Graff KG: *See*—
Dorpemund, Willi, 4,437,211, Cl. 24-287.000.

Gradel, Gerhard: *See*—
Dorr, Wolfgang; Gradel, Gerhard; and Peehs, Martin, 4,438,050, Cl. 264-0.500.

Graham, Neil B., to National Research Development Corporation. Hydrogels. 4,438,258, Cl. 528-361.000.

Graiff, L. B.; and Laity, John L., to Shell Oil Company. Antiknock additive compositions and unleaded gasoline containing same. 4,437,436, Cl. 123-1.00A.

Gram Research & Development Co.: *See*—
Mayne, Sherman T., 4,437,999, Cl. 210-748.000.

Granges Metallverken Aktiebolag: *See*—
Jonasos, Karl G., 4,437,216, Cl. 29-157.30A.

Grapho Metronic Mess- und Regeltechnik GmbH & Co. KG: *See*—
Wirz, Burkhardt; and Preass, Alfred, 4,437,407, Cl. 101-409.000.

Graser, Earl J., to Manville Service Corp. Beverage package and production blank with improved locking features. 4,437,606, Cl. 229-40.000.

Gray, Charles C.: *See*—
De Young, Simon A.; and Gray, Charles C., 4,437,530, Cl. 180-75.000.

Graziani, Gabriele: *See*—
Nardi, Dante; Tajana, Alberto; Motta, Gianni; Cazzulani, Pietro; and Graziani, Gabriele, 4,438,133, Cl. 424-300.000.

Greenberg, Mitchell H. Valve respirator device. 4,437,461, Cl. 128-205.240.

Greenhouse, Walter V. V.: *See*—
Fracalossi, Roland N.; Greenhouse, Walter V. V.; and Buchanan, Michael S., 4,438,220, Cl. 521-55.000.
Fracalossi, Roland N.; Greenhouse, Walter V. V.; and Buchanan, Michael S., 4,438,221, Cl. 521-55.000.

Gregory, Oran A. Method and apparatus for dismounting trunnion bearings. 4,437,220, Cl. 29-426.500.

Greiner, Harry M., to M.A.N. Roland Druckmaschinen Aktiengesellschaft. System for adjusting printing plates mounted on plate cylinders. 4,437,403, Cl. 101-248.000.

Grell, Ute: *See*—
Banke, Karl-Heinz; Hering, Elisabeth; Lobel, Wilfried; Pollack, Dieter; Wiedemann, Gunter; Grell, Ute; and Schuler, Ingo, 4,438,053, Cl. 264-25.000.

Greutmann, Hans, to Allied Corporation. Motor having insulationless armature connections. 4,437,230, Cl. 29-597.000.

Grew, Edward L.; and Wilson, Nigel D. V., to Glaxo Group Limited. Quaternary ammonium salts. 4,438,046, Cl. 260-501.150.

Gries, Josef: *See*—
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjurweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

Griffin, Brian P.: *See*—
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Griffin, Freddie, Jr.: *See*—
Svatek, Katherine H.; Wilson, David A.; and Griffin, Freddie, Jr., 4,438,040, Cl. 260-439.00R.

Griffith, Richard M.; and Shanoski, Henry, to General Tire & Rubber Company, The. In-mold coating method. 4,438,062, Cl. 264-255.000.

Grimsley, R. Leroy; and Gawel, Len J., to Conoco Inc. Pyramidal offshore structure. 4,437,794, Cl. 405-224.000.

Grinde, James E., to Yamaha Hatsudoki Kabushiki Kaisha. Snow vehicle. 4,437,534, Cl. 180-190.000.

Grogler, Gerhard; Ganster, Otto; and Recker, Klaus, to Bayer Aktiengesellschaft. Suspensions of isocyanato ureas in isocyanate prepolymers, a process for their production and their use in the production of high molecular-weight polyurethane plastics. 4,438,250, Cl. 528-66.000.

Grollier, Jean-Francois; and Allec, Josiane, to Societe Anonyme dite: L'Oreal. New cosmetic compositions for hair or skin conditioning, and the application thereof. 4,438,095, Cl. 424-70.000.

Grot, Walter G.: *See*—
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Grove Valve and Regulator Company: *See*—
Bianchi, Giuseppe, 4,437,486, Cl. 137-315.000.

Grubb, Lawrence B.: *See*—
Simpson, Danny E.; Williams, David M.; Chase, Richard A.; and Grubb, Lawrence B., 4,437,668, Cl. 273-156.000.

Gruber, Peter; Schmid, Jochen; Lechner, Horst; and Bauer, Eckhart, to Dr. Karl Thomae GmbH. Bromhexine delayed-release pharmaceutical form. 4,438,091, Cl. 424-21.000.

Grundken, Dieter: *See*—
Redder, Manfred; Linke, Horst; Grundken, Dieter; and Temme, Helmut, 4,437,564, Cl. 198-834.000.

Grynkewich, Gregory W., to Olin Corporation. Phosphorylated and thiophosphorylated poly(oxyalkylated) hydrazines and selected adducts and their use as corrosion inhibitors. 4,438,013, Cl. 252-146.000.

GTE Laboratories Incorporated: *See*—
Cogan, Adrian I., 4,437,925, Cl. 156-653.000.

GTE Products Corporation: *See*—
Hope, Lawrence L.; and Davey, Ernest A., 4,437,966, Cl. 204-298.000.

Gueret, Jean-Louis H., to "L'Oreal". Make of unit comprising a container and an applicator closing the container. 4,437,477, Cl. 132-88.500.

Guhne, Wieland, to Vorwerk & Co. Interholding GmbH. Vacuum cleaner housing. 4,437,204, Cl. 15-325.000.

Guillaume, Paul; and Karinthi, Pierre, to L'air Liquide, Societe Anonyme Pour L'etude et L'exploitation des Procedes Georges Claude. Methods of and apparatus for treating waste products. 4,437,418, Cl. 110-246.000.

Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, to Societe Anonyme dite: L'Oreal. Salts of acid dyes and copolymers having tertiary amine functions, process for preparing said salts and makeup cosmetic compositions containing them. 4,438,140, Cl. 424-61.000.

Guimond, Roy A.: *See*—
Gulliksen, John E.; Guimond, Roy A.; Daly, Charles F.; and Hamilton, William H., 4,438,483, Cl. 362-183.000.

Gulf Canada Limited: *See*—
Johnson, Herbert S., 4,437,706, Cl. 299-7.000.

Gulf Research & Development Company: *See*—
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Gulliksen, John E.; Guimond, Roy A.; Daly, Charles F.; and Hamilton, William H., to Koehler Manufacturing Co. Utility handlamp and charging component means therefor. 4,438,483, Cl. 362-183.000.

Guziec, Frank S., Jr., to Thiokol Corporation. 4-Dimethylaminopyridinium chlorochromate. 4,438,269, Cl. 546-9.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. Static VAR generation for transmission line compensation of subsynchronous resonance. 4,438,386, Cl. 323-210.000.

H & K Computer Corporation: *See*—
Strom, Alan R., 4,438,506, Cl. 364-900.000.

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Habich, Dieter: *See*—
Boberg, Michael; Habich, Dieter; Metzger, Karl G.; and Naab, Paul, 4,438,114, Cl. 424-248.510.

Hack, Joachim: *See*—
Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, 4,438,462, Cl. 360-2.000.

Hackenberg, Hubert: *See*—
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Haeck, Paul J., to Household Manufacturing Inc. Fluid shear coupling apparatus. 4,437,554, Cl. 192-58.00B.

Haga, Kyosuke: *See*—
Nakamura, Keiichi; Haga, Kyosuke; and Mori, Yutaka, 4,437,532, Cl. 180-142.000.

Hague International: *See*—
Lallaye, Paul G.; Bjerklie, John W.; and Penty, Robert A., 4,437,217, Cl. 29-157.400.

Hahn, Geraldine L. Countertop mini-garbage can. 4,437,575, Cl. 220-1.00T.
Hahs, Gregory L., to Optical Radiation Corp. Intraocular lens assembly. 4,437,194, Cl. 3-13.000.
Haissig, Manfred: *See*—
Ahrens, Max; and Haissig, Manfred, 4,437,509, Cl. 164-454.000.
Hajnal, Stephen. Three dimensional camera system. 4,437,745, Cl. 354-117.000.
Halcon SD Group, Inc., The: *See*—
Bhise, Vijay S.; and Hoch, Robert, 4,437,938, Cl. 203-14.000.
Bhise, Vijay S.; and Hoch, Robert, 4,437,939, Cl. 203-14.000.
Hales, Paul D. Remote temperature control activation apparatus. 4,438,295, Cl. 179-2.00A.
Haley, Paul H., to Westinghouse Electric Corp. Ultra-high speed protective relay apparatus and method for providing single pole switching. 4,438,475, Cl. 361-82.000.
Halfaker, Thomas C., to Emerson Electric Co. Ceiling panel. 4,437,287, Cl. 52-588.000.
Halin, Yves R.; and Hersen, Rene M. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, S.N.E.C.M.A. Device for the detection of the position of the thrust reverser of a turbojet engine. 4,437,783, Cl. 403-27.000.
Hall, John J., Jr. Boring tool having a detachable cutting blade. 4,437,802, Cl. 408-197.000.
Hallett, Peter: *See*—
Collington, Eric W.; Hallett, Peter; and Wallis, Christopher J., 4,438,111, Cl. 424-246.000.
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,438,112, Cl. 424-244.000.
Halopoff, David, to Holmes-Hally Industries. Protective hasp for padlock. 4,437,692, Cl. 292-57.000.
Hamada, Fumio, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic photosensitive material. 4,438,194, Cl. 430-505.000.
Hamamatsu Corporation: *See*—
Schiller, Norman H.; and Alfano, Robert R., 4,438,416, Cl. 333-160.000.
Hamano, Kiyoshi: *See*—
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Hambleton, Thomas P., to International Paper Company. Plastic sack holder. 4,437,634, Cl. 248-97.000.
Hamblin, Andrew. Emergency fire and smoke safety kit. 4,437,568, Cl. 206-223.000.
Hambrecht, Juergen: *See*—
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Hamerlinck, R. Dean. Pressurized container testing apparatus. 4,437,353, Cl. 73-863.810.
Hamilton, Roland M.: *See*—
Anderson, Harold R.; and Hamilton, Roland M., 4,437,544, Cl. 182-120.000.
Hamilton, William H.: *See*—
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Hammond, William P. Signal responsive automatic control for audio equipment. 4,438,527, Cl. 381-107.000.
Hampe, Christoph: *See*—
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Hamprecht, Gerhard: *See*—
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Hands, David, to Clayton Environmental Consultants, Inc. Apparatus and method for asbestos fiber release potential. 4,437,333, Cl. 73-12.000.
Handy, Roland J.: *See*—
Tandon, Jagdish C.; Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Stoffel, James C., 4,438,457, Cl. 358-213.000.
Hansen, Glen D.: *See*—
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Hansen, Svenn S.: *See*—
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Haque, Yusuf A.; Saletore, Vikram; and Schuler, Jeffrey A., to American Microsystems, Incorporated. Monolithic programmable gain-integrator stage. 4,438,354, Cl. 307-493.000.
Hara, Hideki: *See*—
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Harada, Hiroshi: *See*—
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Harada, Masahiro: *See*—
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Harada, Tosiharu: *See*—
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Harbauer, Werner, to Siemens Aktiengesellschaft. Screwless terminal. 4,437,720, Cl. 339-95.00D.
Harco Corporation: *See*—
Rog, Joseph W.; Waits, Charles G.; and Nicholas, Karl W., 4,438,391, Cl. 324-71.100.
Hardy, John W., to Itek Corporation. Wavefront sensor employing a modulation reticle. 4,438,330, Cl. 250-201.000.
Hargis, Richard A., to Day Mixing Company. Lower support for single screw mixer. 4,437,767, Cl. 366-287.000.
Harmer, George A., to Lucas Industries Limited. Friction lining wear indicators for shoe-drum brakes. 4,437,547, Cl. 188-1.110.
Harmon, William J., Jr.; Mick, John R.; and Coleman, Vernon, to Advanced Micro Devices, Inc. Interruptable microprogram controller for microcomputer systems. 4,438,492, Cl. 364-200.000.
Harnden, John D., Jr.; and Kornrumpf, William P., to General Electric Company. Low cost volt/ampere meter with liquid crystal display. 4,438,396, Cl. 324-127.000.
Harrington, Alan L.; Allison, Richard; and Rodov, Vladimir, to TRW Inc. Zig-zag V-MOS transistor structure. 4,438,448, Cl. 357-23.000.
Harris Corporation: *See*—
Casper, Paul W.; and Ashley, William B., 4,438,348, Cl. 307-310.000.
Harris, Lewis K.; and Burrus, Billie S., to Combustion Engineering, Inc. Burner and pilot valve safety control system. 4,437,830, Cl. 431-54.000.
Harrison, Loren C. Water-sensitive probe valve for use with a gas leak detector. 4,437,482, Cl. 137-67.000.
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., to Continental Group, Inc., The. Blow molding apparatus. 4,437,825, Cl. 425-145.000.
Harsco Corporation: *See*—
DeVore, Robert F., 4,437,512, Cl. 165-122.000.
Hartman, George D., to Merck & Co., Inc. Triazolopyrazinamines useful as adjuncts to radiation therapy. 4,438,266, Cl. 544-350.000.
Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See*—
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Hartung, Michael H.; Rieck, Richard E.; and Tayler, Gerald E., to International Business Machines Corporation. Method and apparatus for verifying storage apparatus addressing. 4,438,512, Cl. 371-60.000.
Harvey Hubbell Incorporated: *See*—
Skrovanek, Ambrox K.; and Evert, Carl A., 4,438,408, Cl. 330-51.000.
Harvey, Kenneth: *See*—
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Hasegawa, Eiichi; and Yamano, Shoji, to Yamato Scale Company, Ltd. Automatic continuous weighing machine. 4,437,561, Cl. 198-504.000.
Hasegawa, Kokichi; and Tokita, Tsugio, to Komori Printing Machinery Co., Ltd. Inking apparatus for an offset press. 4,437,406, Cl. 101-350.000.
Hashimoto, Shunichi: *See*—
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Haskin, John R., deceased, to Ball, Larry L., a part interest. Portable map display device. 4,437,739, Cl. 353-27.00R.
Hata, Shun-ichi: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, 4,438,115, Cl. 424-250.000.
Hattori, Hiroyuki: *See*—
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Haug, Werner, to Frama AG. Apparatus for transferring ink to the ink plate of a metering machine. 4,437,405, Cl. 101-349.000.
Hauser, Karl. Process and apparatus for controlling the cutting feed of band saw machines. 4,437,367, Cl. 83-13.000.
Hawryluk, Raymond; Johnson, Clyde R.; and Masarky, N. Henri, to Union Oil Company of California. Ore roasting with recycle of gases. 4,437,884, Cl. 75-7.000.
Hay, Lloyd F.: *See*—
Rica, Albert F.; Hay, Lloyd F.; Heron, John R.; Webber, John R.; and Rechtsteiner, Steven A., 4,437,315, Cl. 62-63.000.
Hayami, Satohiro: *See*—
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Hayasaka, Tadao; Suzuki, Masahiro; Ozawa, Shigeru; and Takeya, Yoshiaki, to Hitachi Powdered Metals Co., Ltd. Method of the preparation of high density sintered alloys based on iron and copper. 4,437,890, Cl. 75-244.000.
Hayase, Shuzi; and Suzuki, Shuichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Photopolymerizable composition based on epoxy compound. 4,437,959, Cl. 204-159.110.
Hayashi, Nobuyuki: *See*—
Ishimaru, Toshiaki; Tsukada, Katsushige; and Hayashi, Nobuyuki, 4,438,190, Cl. 430-281.000.
Hayashi, Shoichiro: *See*—
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Hayashi, Yoshihiro: *See*—
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Hayes, Thomas E., to Johnson Service Company. Mechanical draft controller with vent damper. 4,437,454, Cl. 126-293.000.
Haynes, Charles W., to Joy Manufacturing Company. Dual camming action jaw assembly and power tong. 4,437,363, Cl. 81-57.180.
Hazeltine Corporation: *See—*
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Headley, James E., deceased: *See—*
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, to Yoder, Henry Frank, III; Yoder, Donald; Willis, Arthur B., deceased, Title Insurance and Trust Company, executor; Butler, Dean S., deceased; Fusco, John A., deceased; Adler, Peter K., deceased; and Headley, James E., deceased, a part interest. Optical rollfiche reader. 4,437,738, Cl. 353-26.00R.
Heberlein, George J. Self-locking truck sideboard lift and dump mechanism. 4,437,705, Cl. 298-1.00R.
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Heck, Ronald M.: *See—*
Dettling, Joseph C.; Carr, William F.; Heck, Ronald M.; and Chen, James M., 4,438,082, Cl. 423-235 000.
Hedges, Charles V.: *See—*
Mark, Victor; and Hedges, Charles V., 4,438,241, Cl. 525-444.000.
Hedrick, Paul L., Jr., to Societe d'Assistance Technique pour Produits Nestle S.A. Foaming creamer and method of making same. 4,438,147, Cl. 426-570.000.
Heider, Merle J., to Jet Co., Inc. Wire roller. 4,437,622, Cl. 242-86.50R.
Heinrich, Hans J.; and Schutt, Dieter, to International Business Machines Corporation. Interrupt pre-processor with dynamic allocation of priority levels to requests queued in an associative CAM. 4,438,489, Cl. 364-200.000.
Heinrich, Horst; Herrmann, Gunter R.; and Schmidt, Manfred, to International Business Machines Corporation. Separator plate for type band printer. 4,437,401, Cl. 101-93.140.
Heinzle, Otto, to Schalungsverleih Heinzle AG. Bracing unit for concrete formwork. 4,437,640, Cl. 249-20.000.
Held, Kurt. Driving device for effecting linear motion. 4,438,360, Cl. 310-83.000.
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Helfer, Joel N.; and King, Phillip W., to American Home Products Corporation. Apparatus for monitoring fetal heartbeat and the like. 4,437,467, Cl. 128-642.000.
Helfman, Robert. Truss construction. 4,437,273, Cl. 52-93.000.
Helinski, Edward F., to International Business Machines Corporation. Serial ring actuator. 4,438,419, Cl. 335-261.000.
Helmer, John C.: *See—*
Abu-Shumays, Ahmad; Helmer, John C.; and Luchetti, Stephen J., 4,437,812, Cl. 417-53.000.
Henkel Corporation: *See—*
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Kiewert, Eva; and Disch, Karlheinz, 4,438,016, Cl. 252-174.250.
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Kollmann, Hans-Josef; Hennemann, Lothar; and Hohorst, Wolfgang, 4,437,721, Cl. 339-97.00P.
Hensler, John M.: *See—*
Settineri, William J.; and Hensler, John M., 4,438,242, Cl. 526-62.000.
Heraeus Quarzschmelze GmbH: *See—*
Treber, Norbert, 4,437,727, Cl. 350-96.300.
Herbert, Everett H.: *See—*
Volk, Kurt E., Jr.; Herbert, Everett H.; and Stenner, John W., 4,437,852, Cl. 493-216.000.
Herbert Kannegiesser GmbH & Co.: *See—*
Wiebesiek, Wilhelm, 4,437,247, Cl. 38-143.000.
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Herd, Sigrid R.: *See—*
Aboaf, Joseph A.; Klokholm, Erik; and Herd, Sigrid R., 4,438,066, Cl. 420-435.000.
Heredy, Laszlo A.; and Skowronski, Raymund P., to Rockwell International Corporation. Molten salt hydrotreatment process. 4,437,980, Cl. 208-235.000.
Hering, Elisabeth: *See—*
Banke, Karl-Heinz; Hering, Elisabeth; Lobel, Wilfried; Pollack, Dieter; Wiedemann, Gunter; Grell, Ute; and Schuler, Ingo, 4,438,053, Cl. 264-25.000.
Heron, John R.: *See—*
Rica, Albert F.; Hay, Lloyd F.; Heron, John R.; Webber, John R.; and Rechtsteiner, Steven A., 4,437,315, Cl. 62-63.000.
Herrmann, Gunter R.: *See—*
Heinrich, Horst; Herrmann, Gunter R.; and Schmidt, Manfred, 4,437,401, Cl. 101-93.140.
Hersen, Rene M. J.: *See—*
Halin, Yves R.; and Hersen, Rene M. J., 4,437,783, Cl. 403-27.000.
Hershberger, Doran D., to General Electric Company. Laundry machine. 4,437,325, Cl. 68-23.700.
Hertel, Karl R., to Pyro-Gen Corp. Incinerator. 4,437,419, Cl. 110-259.000.
Herweh, John E., to Armstrong World Industries, Inc. Polyurethane polymers comprising macrocyclic crown ethers in the polymer backbone. 4,438,251, Cl. 528-73.000.
Herwig, Walter: *See—*
Geisler, Ulrich; and Herwig, Walter, 4,438,189, Cl. 430-280.000.
Hettche, Albert: *See—*
Oeder, Dieter; Ziegler, Walter; Daeuble, Manfred; Dietsche, Wolfram; Hettche, Albert; and Weiss, Stefan, 4,438,008, Cl. 252-56.00R.
Hetterich, Hermann: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Horling, Peter; Hetterich, Hermann; and Kunkel, Heinrich, 4,437,214, Cl. 29-149.5DP.
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,437,330, Cl. 72-358.000.
Heveran, John E.: *See—*
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Hewlett-Packard Company: *See—*
Casale, Michael A., 4,437,489, Cl. 137-487.500.
Cloutier, Frank L.; Low, Robert N.; and McClelland, Paul H., 4,438,191, Cl. 430-324.000.
Hibbel, Josef: *See—*
Gorris, Rainer; Hibbel, Josef; Gerhardus, Ulrich; and Scheve, Heinrich, 4,437,864, Cl. 48-62.00R.
Hicks, John M.; and Engel, Joseph C., to North American Philips Electric Corp. Unitary light source comprising compact HID lamp and incandescent ballast filament. 4,438,369, Cl. 315-49.000.
Hill, Ira D.: *See—*
Lindauer, Jerome I.; Hill, Ira D.; and Liberman, Arthur L., 4,438,010, Cl. 252-91.000.
Hilti Aktiengesellschaft: *See—*
Gloor, Peter, 4,437,526, Cl. 175-346.000.
Hinds, James J.; Hoeflich, John C.; and Kolodziej, George C., to National Can Corporation. Container defect monitoring system. 4,437,985, Cl. 209-538.000.
Hinn, Werner; and Knight, Mark B., to RCA Corporation. Dual-standard SECAM/PAL color TV receiver with automatic control of operating mode. 4,438,451, Cl. 358-11.000.
Hino, Masatoshi: *See—*
Okada, Yoshio; Terauchi, Takashi; Naoki, Makoto; and Hino, Masatoshi, 4,438,021, Cl. 502-341.000.
Hino, Seiichi: *See—*
Ohta, Takayuki; Yanaga, Yukio; and Hino, Seiichi, 4,438,256, Cl. 528-188.000.
Hinojos, Paul R. Retractable automobile sideguard. 4,437,697, Cl. 293-118.000.
Hinze, Jay W.: *See—*
Gaul, David J.; Hinze, Jay W.; and Perkins, Richard A., 4,438,518, Cl. 373-39.000.
Hiraga, Masaharu: *See—*
Terauchi, Kiyoshi; and Hiraga, Masaharu, 4,437,820, Cl. 418-55.000.
Hirano, Hirofumi, to Canon Denshi Kabushiki Kaisha. Printing mechanism. 4,437,776, Cl. 400-142.000.
Hirano, Takashi: *See—*
Omae, Michinobu; and Hirano, Takashi, 4,437,527, Cl. 177-25.000.
Hiraoka, Tetsuo; and Kobayashi, Takeo, to Sankyo Company Limited. Esters of 7-sulfenyliminocephem-4-carboxylic acids. 4,438,265, Cl. 544-29.000.
Hirayama, Masashi: *See—*
Tamura, Hisashi; Ito, Ichizo; Hirayama, Masashi; and Ando, Tetsuo, 4,437,350, Cl. 73-861.240.
Hirooka, Susumu: *See—*
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Hirose, Kikuji: *See—*
Saito, Takao; Morita, Jyun-ichi; Hirose, Kikuji; and Kato, Akitosi, 4,437,947, Cl. 204-35.00R.
Hirota, Eiichi: *See—*
Sakakima, Hiroshi; Satomi, Mitsuo; Senno, Harufumi; and Hirota, Eiichi, 4,437,912, Cl. 148-403.000.
Hitachi Cable Ltd.: *See—*
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Kelzo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,438,155, Cl. 427-49.000.
Hitachi Chemical Company, Ltd.: *See—*
Ishimaru, Toshiaki; Tsukada, Katsushige; and Hayashi, Nobuyuki, 4,438,190, Cl. 430-281.000.
Hitachi, Ltd.: *See—*
Asai, Setsuro, 4,437,321, Cl. 62-324.200.
Fukui, Yutaka; and Kashimura, Tetsuo, 4,437,913, Cl. 148-408.000.
Hosoki, Shigeyuki; Futamoto, Masaaki; Kawabe, Ushio; Ishitani, Tohru; and Tamura, Hifumi, 4,438,371, Cl. 315-111.810.
Itagaki, Tsuguo, 4,438,528, Cl. 455-182.000.
Kamata, Yasuji, 4,438,366, Cl. 315-1.000.
Kawamura, Sinichiro, 4,438,297, Cl. 179-117.000.
Kikkawa, Ryozo; and Takeshima, Masaki, 4,437,933, Cl. 159-17.00R.
Kobayashi, Mamoru; Ishige, Kanji; Sasaki, Hideaki; Tani, Mitsukiyo; and Kawakami, Yashuhiko, 4,437,603, Cl. 228-4.500.
Saito, Yukio; Nogita, Shunsuke; Watanabe, Syoji; and Baba, Kenji, 4,437,992, Cl. 210-603.000.
Sato, Hiroyasu; Yamamoto, Kaznaki; and Aotsu, Hiroaki, 4,438,385, Cl. 322-28.000.

Sudo, Ryoichi; Shoji, Fusaji; Watanabe, Takeshi; Suzuki, Kenkichi; and Ooue, Michio, 4,437,731, Cl. 350-340.000.
Usuda, Koji, 4,438,449, Cl. 357-41.000.
Watanabe, Yoshio; Yamane, Mikiya; and Tomura, Teruichi, 4,438,373, Cl. 315-334.000.
Yamamoto, Hideharu; and Tsuneno, Hiroshi, 4,437,228, Cl. 29-590.000.

Hitachi Maxell, Ltd.: *See*—
Kamei, Hideaki; Yamanaka, Kazuhiko; Fujisawa, Haruhiko; and Oda, Shinichiro, 4,438,468, Cl. 360-92.000.

Hitachi Powdered Metals Co., Ltd.: *See*—
Hayasaka, Tadao; Suzuki, Masahiro; Ozawa, Shigeru; and Takeya, Yoshiaki, 4,437,890, Cl. 75-244.000.

Hittel, Gerhard; Muhl, Hubertus; Eigl, Franz; and Langer, Werner, to Karl Mayer Textilmaschinen fabrik GmbH. Warp knitting machine with weft insertion magazine and substrate provision arrangement. 4,437,323, Cl. 66-84.00A.

Ho, Pang T.: *See*—
Rubin, Michael D.; and Ho, Pang T., 4,438,411, Cl. 330-289.000.

Hoch, Robert: *See*—
Bhise, Vijay S.; and Hoch, Robert, 4,437,938, Cl. 203-14.000.
Bhise, Vijay S.; and Hoch, Robert, 4,437,939, Cl. 203-14.000.

Hoechst Aktiengesellschaft: *See*—
Geissler, Ulrich; and Herwig, Walter, 4,438,189, Cl. 430-280.000.
Idstein, Hermann, 4,437,754, Cl. 355-3.0TR.
Moraw, Roland, 4,438,321, Cl. 219-216.000.
Rieck, Hans-Peter, 4,438,081, Cl. 423-300.000.

Hoefke, Wolfgang: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Gaida, Wolfram; and Hoefke, Wolfgang, 4,438,118, Cl. 424-251.000.

Hoeflich, John C.: *See*—
Hinds, James J.; Hoeflich, John C.; and Kolodziej, George C., 4,437,985, Cl. 209-538.000.

Hoeke Engineering, N.V.: *See*—
Van der Velden, Jan H., 4,438,055, Cl. 264-44.000.

Hofbauer, Peter, to Volkswagenwerk AG. Fuel injection device. 4,437,443, Cl. 123-446.000.

Hoffelner, Volkwin. Device for generating sound waves at relatively high frequencies. 4,437,428, Cl. 116-137.00R.

Hoffman, Howard O., to Sears, Roebuck and Co. Shelf retainer. 4,437,572, Cl. 211-86.000.

Hoffmann-La Roche Inc.: *See*—
Fahrenholtz, Kenneth E.; and Heveran, John E., 4,438,207, Cl. 436-543.000.

Hofgen, Gunter; and Ecklundt, Hinrich, to International Standard Electric Corporation. Two-way ranging system. 4,438,435, Cl. 343-7.300.

Hogg, Walter R., to Coulter Electronics, Inc. Tandem sensing zones for improved signal-to-noise ratio in particle analyzer. 4,438,390, Cl. 324-71.100.

Hohorst, Wolfgang: *See*—
Kollmann, Hans-Josef; Hennemann, Lothar; and Hohorst, Wolfgang, 4,437,721, Cl. 339-97.00P.

Holden, M. James, to Mobil Oil Corporation. Method and apparatus for measuring and controlling foam sheet blow-up in a thermoformer oven. 4,438,054, Cl. 264-40.600.

Holland, Frank S., to Manchem, Limited. Electrolysis of tin complexes. 4,437,949, Cl. 204-59.00M.

Hollister, Kenneth R.: *See*—
Ponticello, Ignazio S.; Hollister, Kenneth R.; and Tuites, Richard C., 4,438,278, Cl. 560-205.000.

Holmes-Hally Industries: *See*—
Halopoff, David, 4,437,692, Cl. 292-57.000.

Holmwood, Graham; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with 1-phenoxy-2-pyridinyl-alkanols. 4,438,122, Cl. 424-263.000.

Holt, Neil L., to Burke Company, The. Lift system for tilt-up walls. 4,437,642, Cl. 249-175.000.

Holyoak, Hugh K. Turtle trap and process of trapping turtles. 4,437,259, Cl. 43-105.000.

Homola, Andrew M.; and Lorenz, Max R., to International Business Machines Corporation. Mono-particle magnetic dispersion in organic polymers for magnetic recording. 4,438,156, Cl. 427-57.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, 4,437,304, Cl. 60-290.000.
Ikenoya, Yasuo; Araki, Masafumi; and Shimizu, Yozi, 4,437,305, Cl. 60-293.000.
Ikenoya, Yasuo; Iwashita, Kanau; and Kimura, Hikaru, 4,437,306, Cl. 60-293.000.

Honda Motor Co., Ltd.: *See*—
Fujimori, Yoshitugu; Takabori, Yasuo; Sakano, Hajime; and Ito, Akitoshi, 4,438,229, Cl. 524-109.000.

Honeycomb Panels Patents Association Inc.: *See*—
See, Jacques L. A.; and Chevanne, Sylvain V. L., 4,437,281, Cl. 52-309.100.

Honeywell Inc.: *See*—
Erickson, Roger D., 4,438,442, Cl. 346-153.100.

Honeywell Information Systems Inc.: *See*—
Cushing, David E.; and Stanley, Philip E., 4,438,493, Cl. 364-200.000.
McIver, Chandler H., 4,437,235, Cl. 29-840.000.
Wilder, Richard P., Jr., 4,438,490, Cl. 364-200.000.

Honma, Toshio: *See*—
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.

Hope, Lawrence L.; and Davey, Ernest A., to GTE Products Corporation. Sputtering cathode apparatus. 4,437,966, Cl. 204-298.000.

Hopfer, Samuel, to General Microwave Corporation. Digital programmable attenuator. 4,438,415, Cl. 333-81.00A.

Hopmann, Mark E.: *See*—
Krause, William F., Jr.; and Hopmann, Mark E., 4,437,522, Cl. 166-382.000.

Hoppner, Eberhard: *See*—
Schnabl, Karl; Hoppner, Eberhard; and Kastl, Hans, 4,438,399, Cl. 324-220.000.

Hori, Fumihisa, to Alps Electric Co., Ltd. Printer having plural type wheel assembly. 4,437,777, Cl. 400-154.200.

Horii, Masami: *See*—
Ochiai, Kuniaki; Horii, Masami; and Ishii, Hidekazu, 4,437,775, Cl. 400-124.000.

Horling, Peter: *See*—
Olschewski,/Armin; Brandenstein, Manfred; Walter, Lothar; Horling, Peter; Hetterich, Hermann; and Kunkel, Heinrich, 4,437,214, Cl. 29-149.5DP.
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,437,330, Cl. 72-358.000.

Horvath, Karoly: *See*—
Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Jozsef; Kekesi, Krisztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter; and Horvath, Karoly, 4,438,132, Cl. 424-285.000.

Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, to Nissan Motor Co., Ltd. Diagnostic system for detecting fault in fuel system of engine having electronic fuel injection system. 4,437,342, Cl. 73-119.00A.

Hosler, Brad W.: *See*—
Budde, David L.; Carson, David G.; Cornish, Anthony L.; Hosler, Brad W.; Johnson, David B.; and Peterson, Craig B., 4,438,494, Cl. 364-200.000.

Hosoe, Kazuya: *See*—
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, 4,437,743, Cl. 354-402.000.

Hosoi, Takuji: *See*—
Minami, Ryohei; Okamura, Shozo; Sunami, Yoshihiko; Hosoi, Takuji; and Kanou, Takuo, 4,437,974, Cl. 208-10.000.

Hosokawa, Mikio: *See*—
Ozaki, Nobuo; and Hosokawa, Mikio, 4,437,357, Cl. 74-475.000.

Hosoki, Shigeyuki; Futamoto, Masaaki; Kawabe, Ushio; Ishitani, Tohru; and Tamura, Hifumi, to Hitachi, Ltd. Source of charged particles beam. 4,438,371, Cl. 315-111.810.

Hosono, Hidekazu: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Ogawa, Tadatoshi; Kotani, Kozo; and Hosono, Hidekazu, 4,438,238, Cl. 525-240.000.

Hotta, Hiroshi: *See*—
Ishizuka, Tetsuo; Hotta, Hiroshi; and Nishimura, Yoshichika, 4,437,861, Cl. 44-1.00R.

Houck, John C.: *See*—
Kimball, Charles D.; and Houck, John C., 4,438,104, Cl. 424-177.000.

Household Manufacturing Inc.: *See*—
Haeck, Paul J., 4,437,554, Cl. 192-58.00B.

Hovsepians, Vigen M., to Vivar, Incorporated. Modular furniture with removable outer fabric. 4,437,704, Cl. 297-440.000.

Howarth, Thomas T.: *See*—
Ponsford, Roger J.; and Howarth, Thomas T., 4,438,101, Cl. 424-114.000.

Howe, Robert K.; and Lee, Len F., to Monsanto Company. 2,4-Disubstituted-5-thiazole-carboxylic acids and derivatives. 4,437,875, Cl. 71-90.000.

Howe, Robert K.; and Lee, Len F., to Monsanto Company. 2,4-Disubstituted-5-thiazole-carboxylic acids and derivatives. 4,437,876, Cl. 71-90.000.

Howerton, Anderson W.; and Foley, Mark P., to Dayco Corporation. Method for cutting polymeric belt body. 4,437,371, Cl. 83-54.000.

Howes, John G. B., to Smith and Nephew Associated Companies Limited. Method for sterilizing soft contact lens. 4,438,011, Cl. 252-106.000.

Hoyne Industries, Inc.: *See*—
Righetti, Gaetano, 4,437,268, Cl. 51-327.000.

HRI, Inc.: *See*—
Huibers, Derk T. A.; and Kydd, Paul H., 4,437,973, Cl. 208-10.000.

Hruda, Robert M., to Westinghouse Electric Corp. Electrical shorting switch assembly including a last to open last to close arcing switch. 4,438,302, Cl. 200-17.00R.

Hsu, Edward H.: *See*—
Fan, Liang-tseng; and Hsu, Edward H., 4,438,000, Cl. 210-786.000.

Hubele, Adolf; Eckhardt, Wolfgang; and Riebli, Peter, to Ciba-Geigy Corporation. Arylamine derivatives and use as microbicides. 4,438,125, Cl. 424-269.000.

Huber, Otto, to Lever Brothers Company. Lavatory cleansing block. 4,438,015, Cl. 252-174.240.

Huber, Willi; and Metz, Manfred, to J. Wagner AG. Reversible quick change nozzle holder for spray guns. 4,437,610, Cl. 239-119.000.

Huck Manufacturing Company: *See*—
Smith, Walter J., 4,437,805, Cl. 411-361.000.

Huffman, Kenneth R.: *See*—
Casey, Donald J.; and Huffman, Kenneth R., 4,438,253, Cl. 528-86.000.
Hughes Aircraft Company: *See*—
Landis, Abraham L., 4,438,273, Cl. 549-303.000.
Hugli, Tony E.: *See*—
Erickson, Bruce W.; and Hugli, Tony E., 4,438,029, Cl. 260-112.50R.
Huguenin, Rene: *See*—
Bauer, Wilfried; Cardinaux, Francois; Huguenin, Rene; Pless, Janos; and Sandrin, Edmond, 4,438,103, Cl. 424-177.000.
Huibers, Derk T. A.; and Kydd, Paul H., to HRI, Inc. Coal hydrogenation process with direct coal feed and improved residuum conversion. 4,437,973, Cl. 208-10.000.
Hull, Evan B. Belt buckle. 4,437,598, Cl. 224-163.000.
Hung, Chi-Wen: *See*—
Imai, Tamotsu; and Hung, Chi-Wen, 4,438,288, Cl. 585-379.000.
Hung, Frederic N. B.: *See*—
Foissac, Yves; and Hung, Frederic N. B., 4,437,288, Cl. 52-637.000.
Hunkapiller, Michael W.: *See*—
Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., 4,438,030, Cl. 260-112.50R.
Hunter, Byron A., to Uniroyal, Inc. Blowing agent composition containing zinc formate and metal salt activator. 4,438,223, Cl. 521-92.000.
Huppertzl Josef: *See*—
Kuhling, Dieter; Huppertzl Josef; Krings, Peter; and Reuter, Herbert, 4,438,012, Cl. 252-131.000.
Hurcum, Ivan B., to Westinghouse Brake and Signal Company Limited. Information display apparatus. 4,438,432, Cl. 340-825.350.
Hurst, Jerry C., to Western Electric Co., Inc. Tools for handling magnetic articles. 4,437,362, Cl. 81-43.000.
Husa, Emmett O. Mechanism for tightening and reinforcing the joint of a folding structure. 4,437,480, Cl. 135-74.000.
Husky Injection Molding Systems Ltd.: *See*—
Brown, Paul, 4,438,065, Cl. 264-335.000.
Hutchins, Charles K.; Thornton, Donald I.; and Peyton, Richard H., to Fram Corporation. Separating device and cartridge therefor. 4,437,986, Cl. 210-130.000.
Huyck Corporation: *See*—
Thompson, Charles E., 4,437,496, Cl. 139-383.00A.
I.M.A.-Industria Macchine Automatiche-S.p.A.: *See*—
Romagnoli, Andrea, 4,437,294, Cl. 53-553.000.
Iannelli, Frank M., to Tannetics, Inc. Beverage dispensing device. 4,437,319, Cl. 62-138.000.
Ibrahim, Abd-El-Fattah A.: *See*—
Tandon, Jagdish C.; Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Stoffel, James C., 4,438,457, Cl. 358-213.000.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Head pressure maintenance for gas defrost. 4,437,317, Cl. 62-81.000.
Ichidate, Minoru: *See*—
Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, 4,437,883, Cl. 75-0.50C.
Umino, Masahide; Tamura, Eijiro; Karasuno, Isamu; Ichidate, Minoru; and Kubo, Toshihiko, 4,437,891, Cl. 75-251.000.
Ichimura, Takeo: *See*—
Fuju, Takamitsu; Ogino, Makoto; Kariya, Michio; and Ichimura, Takeo, 4,437,192, Cl. 3-1.900.
Ichter, William J.: *See*—
Cribben, James T.; and Ichter, William J., 4,437,284, Cl. 52-456.000.
ICI Americas Inc.: *See*—
Rutledge, Thomas F., 4,438,037, Cl. 260-385.000.
Idstein, Hermann, to Hoechst Aktiengesellschaft. Apparatus for transferring toner images. 4,437,754, Cl. 355-3.0TR.
IHC Holland N.V.: *See*—
Verboom, Pieter, 4,437,244, Cl. 37-63.000.
Iida, Toshihide: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,437,757, Cl. 355-15.000.
Iijima, Ikuo: *See*—
Gaino, Mitsunori; Iijima, Ikuo; Nishimoto, Shigeru; Ikeda, Kuichiro; and Fujii, Tokuo, 4,438,035, Cl. 260-239.30B.
Iimura, Yoshitaka: *See*—
Yoshieda, Keiichi; and Iimura, Yoshitaka, 4,437,233, Cl. 29-768.000.
Iizuka, Yutaka, to Nippon Kogaku K.K. Lenses capable of close-up photography. 4,437,734, Cl. 350-454.000.
Ikari, Kazuo, to Olympus Optical Co., Ltd. Adjustable diopter type finder optical system. 4,437,750, Cl. 354-155.000.
Ikeda, Kuichiro: *See*—
Gaino, Mitsunori; Iijima, Ikuo; Nishimoto, Shigeru; Ikeda, Kuichiro; and Fujii, Tokuo, 4,438,035, Cl. 260-239.30B.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Photo metering device for single lens reflex camera. 4,437,746, Cl. 354-479.000.
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, to Honda Giken Kogyo Kabushiki Kaisha. Structure for controlling operations of secondary air supply means and throttle opener in internal combustion engine for motorcycles. 4,437,304, Cl. 60-290.000.
Ikenoya, Yasuo; Araki, Masafumi; and Shimizu, Yozi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas cleaning system for internal combustion engines. 4,437,305, Cl. 60-293.000.
Ikenoya, Yasuo; Iwashita, Kanau; and Kimura, Hikaru, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas cleaning device of internal combustion engine. 4,437,306, Cl. 60-293.000.
Illinois Tool Works Inc.: *See*—
Peterson, Francis C., 4,437,784, Cl. 403-408.000.
Imai, Tamotsu, to UOP Inc. Preparation of alcohols. 4,438,287, Cl. 568-909.000.
Imai, Tamotsu; and Hung, Chi-Wen, to UOP Inc. Dehydrogenation of hydrocarbons with a halogen contacting step. 4,438,288, Cl. 585-379.000.
Imai, Tomoyuki: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,437,881, Cl. 75-0.5AA.
Imazaike, Mikiharu. Gear. 4,437,356, Cl. 74-411.000.
IMC Magnetics Corp.: *See*—
Manson, Harry G., 4,438,361, Cl. 310-90.000.
Immeyer, Fritz H.; and Wesche, Michael, to Dr. Immeyer GmbH. Bird-feeding member. 4,437,432, Cl. 119-18.000.
Imperial Chemical Industries Limited: *See*—
Carroll, William G.; Farley, Peter; and Marklow, Raymond J., 4,438,252, Cl. 528-75.000.
Imperial Chemical Industries PLC: *See*—
Cogswell, Frederic N.; Griffin, Brian P.; and Rose, John B., 4,438,236, Cl. 525-165.000.
In Situ Technology, Inc.: *See*—
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,437,520, Cl. 166-261.000.
INA Walzlager Schaeffler KG: *See*—
Speil, Walter, 4,437,439, Cl. 123-90.560.
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Maruo, Tsunehiro; and Inagaki, Masaomi, 4,438,398, Cl. 324-173.000.
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Fralish, Mark R., 4,437,529, Cl. 180-69.00C.
Ingersoll-Rand Company: *See*—
Schwartz, Jeremy; and Frick, Raymond, 4,437,822, Cl. 418-122.000.
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Inoue, Kiyoshi, 4,437,908, Cl. 148-108.000.
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Safonnikov, Anatoly N.; and Antonov, Anatoly V., 4,438,313, Cl. 219-73.100.
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Doev, Vitaly S.; Kotelyansky, Iosif M.; Kravchenko, Valery B.; Monosov, Yakov A.; Shakhunov, Valery A.; and Kopylov, Jury L., 4,438,443, Cl. 346-153.100.
Institute of Gas Technology: *See*—
Sammells, Anthony F.; and St. John, Michael R., 4,437,954, Cl. 204-129.000.
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Budde, David L.; Carson, David G.; Cornish, Anthony L.; Hosler, Brad W.; Johnson, David B.; and Peterson, Craig B., 4,438,494, Cl. 364-200.000.
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Aboaf, Joseph A.; Klokholm, Erik; and Herd, Sigrid R., 4,438,066, Cl. 420-435.000.
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Homola, Andrew M.; and Lorenz, Max R., 4,438,156, Cl. 427-57.000.
Kemlage, Bernard M., 4,437,897, Cl. 148-1.500.
Schaller, Karl H.; and Zimmermann, Volker, 4,438,467, Cl. 360-77.000.
Woodworth, George K., 4,438,472, Cl. 361-13.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,437,476, Cl. 131-276.000.
Lindauer, Jerome I.; Hill, Ira D.; and Liberman, Arthur L., 4,438,010, Cl. 252-91.000.
International Harvester Co.: *See*—
Rock, Merlin A., 4,437,295, Cl. 56-10.200.
International Monopoly Association: *See*—
Whang, Kyu B., 4,437,862, Cl. 44-6.000.
International Paper Company: *See*—
Hambleton, Thomas P., 4,437,634, Cl. 248-97.000.
International Rectifier Corporation: *See*—
Fleischer, Kenneth H., 4,438,356, Cl. 307-571.000.
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Ishii, Hidekazu: *See*—
Ochiai, Kuniaki; Horii, Masami; and Ishii, Hidekazu, 4,437,775, Cl. 400-124.000.

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Ishida, Hideaki; Ishikawa, Tomohisa; Yamana, Koji; and Kayahara, Takehiko, 4,437,378, Cl. 84-1.180.

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Kubo, Katsuro; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,438,201, Cl. 435-228.000.

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Ishiyama, Shozo, to Konishirokou Photo Industry Co., Ltd. Wide magnification-variable range zoom lens system. 4,437,732, Cl. 350-427.000.

Ishizuka, Tetsuo; Hotta, Hiroshi; and Nishimura, Yoshichika, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Coal-deashing process. 4,437,861, Cl. 44-1.00R.

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Issa, Darrell E.: *See*—
Adkins, Joey B., 4,438,426, Cl. 340-64.000.

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Itek Corporation: *See*—
Hardy, John W., 4,438,330, Cl. 250-201.000.

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Fujimori, Yoshitugu; Takabori, Yasuo; Sakano, Hajime; and Ito, Akitoshi, 4,438,229, Cl. 524-109.000.

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Tamura, Hisashi; Ito, Ichizo; Hirayama, Masashi; and Ando, Tetsuo, 4,437,350, Cl. 73-861.240.

Ito, Shinzo; Kato, Tateshi; Noma, Takumi; Sugimoto, Soichiro; and Toiyama, Seigi, to Nippondenso Co., Ltd. Apparatus for measuring an injection amount. 4,437,341, Cl. 73-119.00A.

Ito, Susumu: *See*—
Suzuki, Takashi; and Ito, Susumu, 4,437,740, Cl. 354-476.000.

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Nojiri, Tadao; Kanemaru, Kenji; Nishikawa, Takayoshi; Matsuyama, Masahiro; and Ito, Yoji, 4,438,422, Cl. 340-52.00F.

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Arita, Yoji; and Seo, Yuzo, 4,437,950, Cl. 204-67.000.

Ivanics, Jozsef: *See*—
Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Jozsef; Kekesi, Krisztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter; and Horvath, Karoly, 4,438,132, Cl. 424-285.000.

Iwai, Sakuya: *See*—
Morohashi, Kazuo; Kajikawa, Teruo; and Iwai, Sakuya, 4,437,918, Cl. 156-322.000.

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Iwamoto, Yoshinao; Suzuki, Shizuo; and Shirasaki, Yuichi, to Kokusai Denshin Denwa Co., Ltd. System for detecting a cable buried under the seabed. 4,438,401, Cl. 324-326.000.

Iwashita, Kanau: *See*—
Ikenoya, Yasuo; Iwashita, Kanau; and Kimura, Hikaru, 4,437,306, Cl. 60-293.000.

Iwata, Kazuhide: *See*—
Shibayama, Shigeki; and Iwata, Kazuhide, 4,438,488, Cl. 364-200.000.

Iwata, Minoru; Murata, Yukio; and Shibata, Tomoyuki, to Ebara Corporation; and Ebara Densan, Ltd. Submersible pump with alternate pump operation control means. 4,437,811, Cl. 417-8.000.

Izutsu, Nozomu: *See*—
Chibata, Ichiro; Sumi, Akihiko; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,438,044, Cl. 260-501.120.

J. Wagner AG: *See*—
Huber, Willi; and Metz, Manfred, 4,437,610, Cl. 239-119.000.

Jacobsen, Ronald L.: *See*—
DelGreco, Angela G.; Allen, Malcolm L.; and Jacobsen, Ronald L., 4,438,024, Cl. 252-545.000.

Jacques, Roland; Reppelin, Michel; and Seigneurin, Laurent, to Rhone-Poulenc Specialites Chimiques. Preparation of aromatic/aliphatic nitriles. 4,438,042, Cl. 260-465.00B.

Jagenberg Werke AG: *See*—
Philipp, Helmut; and Kurth, Wilfried, 4,437,370, Cl. 83-23.000.

James River Corporation of Virginia: *See*—
Morse, Erwin E., 4,438,263, Cl. 536-56.000.

James, William. Plate separator construction and method. 4,437,988, Cl. 210-237.000.

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Nomoto, Reishi; Akimoto, Masahiro; and Takahashi, Masayoshi, 4,437,465, Cl. 128-340.000.

Janosik, Daniel R., Sr. Sun viewing apparatus. 4,437,736, Cl. 350-538.000.

Jatteau, Michel; Lelong, Pierre H.; and Pergrale, Jean, to U.S. Philips Corporation. Gamma camera comprising a localizing scintillation intensifier. 4,438,334, Cl. 250-363.00S.

Jaunich, Helmut: *See*—
Dunkelmann, Dietger; Jaunich, Helmut; and Schiffarth, Josef, 4,438,515, Cl. 373-88.000.

Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert, 4,437,553, Cl. 192-46.000.
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Jecker, Gilbert, to Rhone-Poulenc Specialites Chimiques. Preparation of titanium/aluminum alloys. 4,437,888, Cl. 75-84.400.

Jefferies, James C., to Biegert Aviation, Inc. Spray boom apparatus for applying chemical dispersants to ocean oil spills. 4,437,630, Cl. 244-136.000.

Jefferson, Clinton F., to Engelhard Corporation. Stabilization of solar films against hi temperature deactivation. 4,437,455, Cl. 126-417.000.

Jeng, David K. H., to Kendall Company, The. Sterile package and method of making. 4,437,567, Cl. 206-210.000.

Jenkins, Thomas E., to General Electric Company. Rack supporting channel and stop. 4,437,715, Cl. 312-348.000.

Jenkins, William M.: *See*—
Goff, Willie, Jr.; and Jenkins, William M., 4,437,779, Cl. 400-208.000.

Jensen, Bruce A., to Phillips Petroleum Company. Fractional distillation process control. 4,438,499, Cl. 364-501.000.

Jerobee Industries, Inc.: *See*—
Weglin, Walter, 4,437,924, Cl. 156-651.000.

Jet Co., Inc.: *See*—
Heider, Merle J., 4,437,622, Cl. 242-86.50R.

Jidosha Kiki Co., Ltd.: *See*—
Ohta, Ryuji, 4,437,390, Cl. 92-84.000.

Jinnai, Koichiro; and Ebi, Yutaka, to Ricoh Company, Ltd. Print-distortion compensating device for the ink jet printing apparatus. 4,438,440, Cl. 346-75.000.

Joachim, Rudolph, to Werner & Pfleiderer. Mixer having two feed worms defining upper and lower mixing regions with an intermediate equilibrium zone. 4,437,766, Cl. 366-287.000.

Jodon Engineering Associates, Inc.: *See*—
Wilson, Scott E., 4,437,338, Cl. 73-116.000.

Johannson, Arne, to Svensk Ideutveckling Handelsbolag. Automatic damper device. 4,437,609, Cl. 236-49.000.

Johansson, Ronny: *See*—
Anderson, Inge; and Johansson, Ronny, 4,437,285, Cl. 52-481.000.

Johnson, Charles R. Exhaust recycle to carburetor of an internal combustion engine. 4,437,447, Cl. 123-568.000.

Johnson, Clyde R.: *See*—
Hawryluk, Raymond; Johnson, Clyde R.; and Masarky, N. Henri, 4,437,884, Cl. 75-7.000.

Johnson, David B.: *See*—
Budde, David L.; Carson, David G.; Cornish, Anthony L.; Hosler, Brad W.; Johnson, David B.; and Peterson, Craig B., 4,438,494, Cl. 364-200.000.

Johnson, Delp W. Insert for foldable concrete building construction with pivot connections, integral lifting bar, and building height control bar. 4,437,272, Cl. 52-64.000.

Johnson, Fred L., Jr., to Texaco Inc. Selective production of monoalkanolamines from alkylene oxides and ammonia over acidic inorganic catalysts. 4,438,281, Cl. 564-477.000.

Johnson, Herbert S., to Gulf Canada Limited. Hydraulic mining of tar sands with submerged jet erosion. 4,437,706, Cl. 299-7.000.

Johnson, James R., to Sor, Inc. Fire resistant pressure switch. 4,438,305, Cl. 200-83.00J.

Johnson & Johnson Baby Products Company: *See*—
Simpson, Danny E.; Williams, David M.; Chase, Richard A.; and Grubb, Lawrence B., 4,437,668, Cl. 273-156.000.

Johnson, Kenneth M., to Singer Company, The. Drive roll monogrammer. 4,437,420, Cl. 112-103.000.

Johnson, Ralph E., to Singer Company, The. Variable pull off for bobbin thread. 4,437,421, Cl. 112-158.00R.

Johnson Service Company: *See*—
Hayes, Thomas E., 4,437,454, Cl. 126-293.000.

Jolly, Walter R.: *See*—
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,437,825, Cl. 425-145.000.

Jonsson, Karl G., to Granges Metallverken Aktiebolag. Method of manufacturing a heat exchanger for cooling and heating purposes. 4,437,216, Cl. 29-157.30A.

Jones, Robert: *See*—
Goldstein, Seth; and Jones, Robert, 4,437,857, Cl. 604-53.000.

Jones, Robert L.; and Wilson, Norman H., to National Research Development Corporation. Prostaglandins. 4,438,136, Cl. 424-309.000.

Jordening, Harold G. Bicycle/wheelchair carrier. 4,437,599, Cl. 224-319.000.

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Flannery, William E.; Josephs, Richard M.; Stein, Barry F.; Wang, Tsing-Chow; and Young, Peter L., 4,437,227, Cl. 29-589.000.

Joy Manufacturing Company: *See*—
Haynes, Charles W., 4,437,363, Cl. 81-57.180.

Joy, Robert D., to Ford Motor Company. Vortex flow meter frequency adjustment. 4,437,349, Cl. 73-861.220.

Juengel, Richard O.; Begin, John D.; and Khalaf, John, to Valeron Corporation, The. Telemetry gage system. 4,437,240, Cl. 33-172.00E.

Jung, Michel: *See*—
Bey, Philippe; and Jung, Michel, 4,438,270, Cl. 546-243.000.

Jung, Richard A., to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Process for utilizing waste heat and for obtaining water gas during the cooling of incandescent coke. 4,437,936, Cl. 201-39.000.

Jung, Rudolf H.: *See*—
Brandstetter, Franz; Hambrecht, Juergen; Jung, Rudolf H.; and Lindenschmidt, Gerhard, 4,438,237, Cl. 525-183.000.

Jungheinrich Unternehmensuerwaltung KG, Firma: *See*—
Bierkarre, Hartwig; Klinger, Gottfried; Radeloff, Jurgen; and Rust, Bernd-Hendrik, 4,437,533, Cl. 180-168.000.

Jungverdorben, Hermann-Josef: *See*—
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,438,060, Cl. 264-206.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Yokoyama, Masao; Kon, Masaharu; and Ota, Hiroshi, 4,437,682, Cl. 280-764.100.

Kabushiki Kaisha Meidensha: *See*—
Ishigami, Hideo; and Tobei, Nobuo, 4,437,372, Cl. 83-320.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Moriya, Shigeru; Yoshida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Tsuge, Hiroshi, 4,437,683, Cl. 280-804.000.
Moriya, Shigeru; Yoshida, Akio; Matsunami, Muneharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, 4,437,684, Cl. 280-804.000.

Kabushiki Kaisha Tomoku: *See*—
Ono, Masayuki, 4,437,850, Cl. 493-89.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Anahara, Meiji; and Omori, Hiroshi, 4,437,302, Cl. 57-333.000.

Kaczmarek, Jerome A. Nail driving tool. 4,437,602, Cl. 227-147.000.

Kadekodi, Narayan K.: *See*—
Tandon, Jagdish C.; Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Stoffel, James C., 4,438,457, Cl. 358-213.000.

Kaga, Takashi, to Tomy Kogyo Co., Inc. Magnetic amusement device. 4,437,262, Cl. 46-242.000.

Kajikawa, Teruo: *See*—
Morohashi, Kazuo; Kajikawa, Teruo; and Iwai, Sakuya, 4,437,918, Cl. 156-322.000.

Kakimoto, Toshihiko, to Nissan Motor Company, Ltd. Fluid-filled engine mount device. 4,437,653, Cl. 267-140.100.

Kakoki Engineering Service Co., Ltd.: *See*—
Nagatsuka, Kenichi, 4,437,202, Cl. 15-320.000.

Kalbac, John F., to Delta Dredge and Pump Corporation. Dredge pump drive system. 4,437,814, Cl. 417-351.000.

Kamata, Shigeru: *See*—
Akashi, Akira; Katsuma, Makoto; Kawamura, Masaharu; Kamata, Shigeru; and Saito, Syuichiro, 4,437,752, Cl. 354-289.000.

Kamata, Yasuji, to Hitachi, Ltd. Cathode-ray tube driving apparatus. 4,438,366, Cl. 315-1.000.

Kamei, Hideaki; Yamanaka, Kazuhiko; Fujisawa, Haruhiko; and Oda, Shinichiro, to Hitachi Maxell, Ltd. Tape cassette transferring machine. 4,438,468, Cl. 360-92.000.

Kamiya, Kazuhiro: *See*—
Watanabe, Isamu; Yamaguchi, Takashi; Kamiya, Kazuhiro; Mori, Toshihito; Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,438,107, Cl. 424-180.000.

Kamoshita, Katsuzo: *See*—
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,437,877, Cl. 71-90.000.
Takahashi, Junya; Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; Katoh, Haruhiko; and Sumida, Seizo, 4,437,880, Cl. 71-120.000.

Kampe, Dennis J.; and Sarangapani, Srinivasan, to Union Carbide Corporation. Process for improved activated carbon having an aluminum-heavy metal spinel. 4,438,216, Cl. 502-101.000.

Kampe, Wolfgang: *See*—
Ross, Carl H.; Kampe, Wolfgang; Bartsch, Wolfgang; Sponer, Gisbert; and Roesch, Egon, 4,438,116, Cl. 424-250.000.
Wiedemann, Fritz; Kampe, Wolfgang; Dietmann, Karl; and Sponer, Gisbert, 4,438,128, Cl. 424-273.00N.

Kampf, Fritz: *See*—
Pietsch, Hartmut; Turke, Wolfgang; Bareuther, Ernst; Kampf, Fritz; and Bings, Hubert, 4,438,076, Cl. 423-30.000.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Nakagawa, Masao; and Nishida, Tatehiko, 4,438,222, Cl. 521-60.000.

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Kawai, Kazumichi; Kaneko, Yasuo; Abe, Keizo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,438,155, Cl. 427-49.000.

Kanemaru, Kenji: *See*—
Nojiri, Tadao; Kanemaru, Kenji; Nishikawa, Takayoshi; Matsuyama, Masahiro; and Ito, Yoji, 4,438,422, Cl. 340-52.00F.

Kanou, Takuo: *See*—
Minami, Ryohei; Okamura, Shozo; Sunami, Yoshihiko; Hosoi, Takuji; and Kanou, Takuo, 4,437,974, Cl. 208-10.000.

Kansas State University Research Foundation: *See*—
Fan, Liang-tseng; and Hsu, Edward H., 4,438,000, Cl. 210-786.000.

Kaplan, Lester J., to Upjohn Company, The. Analgesic 1-oxa-, aza- and thia-spirocyclic compounds. 4,438,130, Cl. 424-274.000.

Kappe, Bernard W.: *See*—
MacFarland, James M.; and Kappe, Bernard W., 4,437,710, Cl. 312-1.000.

Karasuno, Isamu: *See*—
Umino, Masahide; Tamura, Eijiro; Karasuno, Isamu; Ichidate, Minoru; and Kubo, Toshihiko, 4,437,891, Cl. 75-251.000.

Kardinal, Hans J., to Siemens Aktiengesellschaft. Pneumatic mail station for the delivery, pneumatically decelerated reception and transit of pneumatic dispatch cases. 4,437,797, Cl. 406-110.000.

Karinthi, Pierre: *See*—
Guillaume, Paul; and Karinthi, Pierre, 4,437,418, Cl. 110-246.000.

Karius, Helmut, to Dr.-Ing. Rudolf Hell G.m.b.H. Control of electric discharge lamps for scanning purposes. 4,438,374, Cl. 315-362.000.

Kariya, Michio: *See*—
Fujiu, Takamitsu; Ogino, Makoto; Kariya, Michio; and Ichimura, Takeo, 4,437,192, Cl. 3-1.900.

Karjalainen, William G., to Neptune Water Meter Company. Compound liquid flow meter with fast crossover characteristic. 4,437,344, Cl. 73-197.000.

Karl Mayer Textilmaschinen fabrik GmbH: *See*—
Hittel, Gerhard; Muhl, Hubertus; Eigl, Franz; and Langer, Werner, 4,437,323, Cl. 66-84.00A.

Karlowsky, Ingo: *See*—
Arens, Egidius; Hampe, Christoph; Karlowsky, Ingo; Meyersieck, Manfred; Schwarz, Hans D.; Anding, Norbert; and Leisterer, Reinhard, 4,438,438, Cl. 343-451.000.

Karrena GmbH: *See*—
Gorris, Rainer; Hibbel, Josef; Gerhardus, Ulrich; and Scheve, Heinrich, 4,437,864, Cl. 48-62.00R.

Karth, Beat: *See*—
Buri, Hermann; and Karth, Beat, 4,437,292, Cl. 53-357.000.

Kasahara, Shin-ichi: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,438,311, Cl. 219-10.49R.

Kasamura, Toshirou: *See*—
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.

Kaseta, Robert G., to Data General Corporation. Stepping motor excitation circuitry. 4,438,380, Cl. 318-696.000.

Kashimura, Tetsuo: *See*—
Fukui, Yutaka; and Kashimura, Tetsuo, 4,437,913, Cl. 148-408.000.

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Kastl, Hans: *See*—
Schnabl, Karl; Hoppner, Eberhard; and Kastl, Hans, 4,438,399, Cl. 324-220.000.

Katcher, Jay H.: *See*—
O'Rourke, Joseph D.; and Katcher, Jay H., 4,438,148, Cl. 426-579.000.

Kato, Akitosi: *See*—
Saito, Takao; Morita, Jyun-ichi; Hirose, Kikuji; and Kato, Akitosi, 4,437,947, Cl. 204-35.00R.

Kato, Katsushi: *See*—
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Kato, Tateshi: *See*—
Ito, Shinzo; Kato, Tateshi; Noma, Takumi; Sugimoto, Soichiro; and Toiyama, Seigi, 4,437,341, Cl. 73-119.00A.

Kato, Yoshiaki: *See*—
Fushida, Akira; and Kato, Yoshiaki, 4,438,187, Cl. 430-81.000.

Katoh, Haruhiko: *See*—
Takahashi, Junya; Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; Katoh, Haruhiko; and Sumida, Seizo, 4,437,880, Cl. 71-120.000.

Katsuma, Makoto: *See*—
Akashi, Akira; Katsuma, Makoto; Kawamura, Masaharu; Kamata, Shigeru; and Saito, Syuichiro, 4,437,752, Cl. 354-289.000.

Katsumata, Yasushi, to Sony Corporation. Active equalizer. 4,438,409, Cl. 330-107.000.

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Katz, Jonathon H., to Teradyne, Inc. Test pin. 4,438,397, Cl. 324-158.00P.
Kaufman, Jeffrey L., to Nicholas Proprietary Limited. Preparation of dihydroxyaluminium sodium carbonate. 4,438,085, Cl. 423-419.00P.
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Hosoki, Shigeyuki; Futamoto, Masaaki; Kawabe, Ushio; Ishitani, Tohru; and Tamura, Hifumi, 4,438,371, Cl. 315-111.810.
Kawai, Hisasi: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,437,345, Cl. 73-204.000.
Kawai, Jyoji, to Mitsubishi Denki Kabushiki Kaisha. Digital phase-shifting circuit. 4,438,487, Cl. 363-129.000.
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Kawai, Toshiyuki: *See*—
Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, 4,437,883, Cl. 75-0.50C.
Kawakami, Susumu: *See*—
Oshiki, Mitsumasa; and Kawakami, Susumu, 4,438,471, Cl. 360-125.000.
Kawakami, Yashuhiko: *See*—
Kobayashi, Mamoru; Ishige, Kanji; Sasaki, Hideaki; Tani, Mitsukiyo; and Kawakami, Yashuhiko, 4,437,603, Cl. 228-4.500.
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, to Canon Kabushiki Kaisha. Double-side image forming apparatus. 4,437,756, Cl. 355-14.00R.
Kawamatsu, Yutaka; and Fujita, Takeshi, to Takeda Chemical Industries, Ltd. Thiazolidine derivatives. 4,438,141, Cl. 424-248.510.
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Kawamura, Sinichiro, to Hitachi, Ltd. Dynamic speaker. 4,438,297, Cl. 179-117.000.
Kawasaki Steel Corporation: *See*—
Tateishi, Junji; Ishikawa, Takeharu; Nakano, Shozaburo; and Nishiyama, Noboru, 4,437,906, Cl. 148-26.000.
Kayahara, Takehiko: *See*—
Ishida, Hideaki; Ishikawa, Tomohisa; Yamana, Koji; and Kayahara, Takehiko, 4,437,378, Cl. 84-1.180.
Kaye, Wilbur I., to Beckman Instruments, Inc. Control of detector gain hysteresis in a single beam spectrophotometer. 4,437,763, Cl. 356-326.000.
Kaye, Wilbur I.: *See*—
Glenn, Thomas J.; and Kaye, Wilbur I., 4,437,762, Cl. 356-326.000.
Kazama, Toyoki: *See*—
Shimatani, Michiro; and Kazama, Toyoki, 4,438,188, Cl. 430-128.000.
Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing estrogens. 4,438,139, Cl. 424-28.000.
Kekesi, Krisztina: *See*—
Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Juzsef; Kekesi, Krisztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter; and Horvath, Karoly, 4,438,132, Cl. 424-285.000.
Keller, Wilbur L. Weatherstripping kit for sliding windows. 4,437,266, Cl. 49-493.000.
Kelly, Richard H., to United States of America, Air Force. High illumination flashbulb array with firing sequence control means. 4,437,748, Cl. 354-132.000.
Kelsey, Jeffrey R., to British Petroleum Company Limited, The. Marine antifouling coating composition. 4,437,892, Cl. 106-15.050.
Kemeny, George A.: *See*—
Deis, Daniel W.; and Kemeny, George A., 4,437,383, Cl. 89-8.000.
Kemlage, Bernard M., to International Business Machines Corporation. Fabrication process for a shallow emitter/base transistor using same polycrystalline layer. 4,437,897, Cl. 148-1.500.
Kemmesies, Hartmut, to Siemens Aktiengesellschaft. Integrable demodulator for digital signals modulated onto carriers. 4,438,407, Cl. 329-50.000.
Kendall Company, The: *See*—
Arkans, Edward J., 4,437,408, Cl. 101-426.000.
Jeng, David K. H., 4,437,567, Cl. 206-210.000.
Kennedy, Maruice E., to Cherry Electrical Products Corporation. Double throw snap action switch. 4,438,304, Cl. 200-67.00D.
Kenyon, Keith E. Novel hybrid electric vehicle. 4,438,342, Cl. 290-45.000.
Kern, Glenn A.: *See*—
Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; Fozo, Steven R.; and Kern, Glenn A., 4,438,497, Cl. 364-431.050.
Kernforschungszentrum Karlsruhe: *See*—
Koehler, Wolfgang; Blocher, Hans-Joachim; and Weiss, Eberhard, 4,437,528, Cl. 180-9.500.
Kerns, Quentin A.; and Miller, Harold W., to United States of America, Energy. High power radio frequency attenuation device. 4,438,367, Cl. 315-5.410.
Kerr, George T.: *See*—
Dessau, Ralph M.; and Kerr, George T., 4,438,215, Cl. 502-71.000.
Kershaw, Bernard J.: *See*—
Lang, Theodore J.; and Kershaw, Bernard J., 4,438,180, Cl. 428-475.800.
Kersten, Hilde: *See*—
Zengel, Hans-Georg; Kersten, Hilde; and Magerlein, Helmut, 4,437,960, Cl. 204-181.00C.
Keswick, Paul D.: *See*—
Chuang, Patrick T.; Keswick, Paul D.; and Linden, Jeffrey L., Sr., 4,438,346, Cl. 307-297.000.
Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,438,139, Cl. 424-28.000.
Khalaf, John: *See*—
Juengel, Richard O.; Begin, John D.; and Khalaf, John, 4,437,240, Cl. 33-172.00E.
Kiamil, Sinan B.: *See*—
Potter, William D.; and Kiamil, Sinan B., 4,438,177, Cl. 428-355.000.
Kida, Shuji: *See*—
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, 4,438,193, Cl. 430-505.000.
Kiewert, Eva; and Disch, Karlheinz, to Henkel Kommanditgesellschaft auf Aktien. Stable aqueous cleaning agents and a process for their production. 4,438,016, Cl. 252-174.250.
Kikkawa, Ryozo; and Takeshima, Masaki, to Hitachi, Ltd. Apparatus for treating radioactive liquid wastes. 4,437,933, Cl. 159-17.00R.
Kikkoman Corporation: *See*—
Nakajima, Motoo; and Mizusawa, Kiyoshi, 4,438,206, Cl. 436-130.000.
Kimball, Charles D.; and Houck, John C., to Endorphin, Inc. Endorphins having placental or pancreatic origin. 4,438,104, Cl. 424-177.000.
Kimberly-Clark Corporation: *See*—
Sigl, Wayne C.; and Frick, Richard H., 4,437,860, Cl. 604-385.000.
Kimura, Hikaru: *See*—
Ikenoya, Yasuo; Iwashita, Kanau; and Kimura, Hikaru, 4,437,306, Cl. 60-293.000.
Kinematic Industries, Inc.: *See*—
Spitz, Melvin P., 4,437,197, Cl. 5-13.000.
King, Jeffery J.: *See*—
Nall, James B.; and King, Jeffery J., 4,438,227, Cl. 524-33.000.
King, Phillip W.: *See*—
Helfer, Joel N.; and King, Phillip W., 4,437,467, Cl. 128-642.000.
King, Roger L.: *See*—
Cawley, James C.; DiMartino, Michael D.; Fisher, Thomas J.; King, Roger L.; and Uhler, Marcus H., 4,438,473, Cl. 361-18.000.
King, Stephen J.; Moffatt, Bruce S.; and Stewart, John C., to Clark & Vicario Corporation. Multiple hydrocyclone apparatus. 4,437,984, Cl. 209-211.000.
Kinnear, Duane W. Fisherman's hand towel and method. 4,437,253, Cl. 43-1.000.
Kinoshita, Takao: *See*—
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, 4,437,743, Cl. 354-402.000.
Kinyosha Co., Ltd.: *See*—
Suguri, Masayoshi; Yamada, Kazuo; and Nandate, Masaaki, 4,438,063, Cl. 264-311.000.
Kishi, Kenichi: *See*—
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, 4,438,193, Cl. 430-505.000.
Kishi, Yoshinori: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Kelzo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,438,155, Cl. 427-49.000.
Kita, Yasushi: *See*—
Aramaki, Minoru; Kita, Yasushi; Nakano, Hishagi; and Moroi, Shiro, 4,438,086, Cl. 423-448.000.
Kitahira, Takashi: *See*—
Furukawa, Mitsuhiki; Miyahara, Michito; Kitahira, Takashi; Misumi, Kiyohito; Shiroyama, Masaharu; and Wada, Toshiaki, 4,438,213, Cl. 501-92.000.
Kitajima, Masao; Seshimoto, Osamu; Kubotera, Kikuo; and Yamaguchi, Akira, to Fuji Photo Film Co., Ltd. Device for determining ionic activity. 4,437,970, Cl. 204-412.000.
Kitamoto, Tatsuji: *See*—
Umemura, Shizuo; Matsufuji, Akihiro; Aonuma, Masashi; Kitamoto, Tatsuji; and Miyatsuka, Hajime, 4,437,882, Cl. 75-0.50R.
Kitamura, Shuji: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Ogawa, Tadatoshi; Kotani, Kozo; and Hosono, Hidekazu, 4,438,238, Cl. 525-240.000.
Kitrell, John V. Mobile travel trunk. 4,437,676, Cl. 280-78.000.
Klauber, Gerald: *See*—
Petito, Ferdinand C.; and Klauber, Gerald, 4,437,844, Cl. 445-5.000.
Kline Manufacturing Company, The: *See*—
Kline, William L., 4,437,389, Cl. 91-499.000.
Kline, Sherman S.: *See*—
Tompkins, Elliot N.; and Kline, Sherman S., 4,437,660, Cl. 271-290.000.
Kline, William L., to Kline Manufacturing Company, The. Axial piston pump having barrel biasing means. 4,437,389, Cl. 91-499.000.
Klinger, Gottfried: *See*—
Bierkarre, Hartwig; Klinger, Gottfried; Radeloff, Jurgen; and Rust, Bernd-Hendrik, 4,437,533, Cl. 180-168.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Collin, Karl-Heinz, 4,437,314, Cl. 60-738.000.
Klokholm, Erik: *See*—
Aboaf, Joseph A.; Klokholm, Erik; and Herd, Sigrid R., 4,438,066, Cl. 420-435.000.

Kluge, Douglas J. Foamed plastic fishing lure body having a controlled density and a one-piece wire and a method for its manufacture. 4,437,257, Cl. 43-42.450.

Knight, Ernest, Jr.: *See*—
Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., 4,438,030, Cl. 260-112.50R.

Knight, Mark B.: *See*—
Hinn, Werner; and Knight, Mark B., 4,438,451, Cl. 358-11.000.

Knoop, Jack P. Tape roll holder having tab forming device. 4,437,854, Cl. 493-353.000.

Kobayashi, Akio: *See*—
Isomura, Shigenori; Kobayashi, Akio; Kato, Katsushi; Kowada, Ichiro; and Nishii, Sachio, 4,437,446, Cl. 123-492.000.

Kobayashi, Mamoru; Ishige, Kanji; Sasaki, Hideaki; Tani, Mitsukiyo; and Kawakami, Yashuhiko, to Hitachi, Ltd. Automatic wiring machine for printed circuit boards. 4,437,603, Cl. 228-4.500.

Kobayashi, Takeo: *See*—
Hiraoka, Tetsuo; and Kobayashi, Takeo, 4,438,265, Cl. 544-29.000.

Koch, David L. Method and apparatus for diversion of downstream migrating anadromous fish. 4,437,431, Cl. 119-3.000.

Kodama, Kouichi: *See*—
Wagu, Masakatsu; Hayashi, Shoichiro; and Kodama, Kouichi, 4,438,106, Cl. 424-180.000.

Kodama, Toshikazu: *See*—
Yamashita, Kiyofumi; and Kodama, Toshikazu, 4,438,417, Cl. 333-193.000.

Koehler Manufacturing Co.: *See*—
Gulliksen, John E.; Guimond, Roy A.; Daly, Charles F.; and Hamilton, William H., 4,438,483, Cl. 362-183.000.

Koehler, Wolfgang; Blocher, Hans-Joachim; and Weiss, Eberhard, to Kernforschungszentrum Karlsruhe. Vehicle with variable undercarriage geometry. 4,437,528, Cl. 180-9.500.

Koenig, C. Fred, III, to Warner & Swasey Company, The. Chuck with centrifugal force compensation. 4,437,675, Cl. 279-1.00C.

Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, to BASF Aktiengesellschaft. Document identification employing exchange-anisotropic magnetic material. 4,438,462, Cl. 360-2.000.

Koetters, Daniel: *See*—
Mallik, Arjun; Koetters, Daniel; and Edelstein, Harold, 4,438,017, Cl. 252-301.170.

Koga, Hirohisa: *See*—
Ohba, Takeo; and Koga, Hirohisa, 4,438,469, Cl. 360-109.000.

Kohama, Tokio: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,437,345, Cl. 73-204.000.

Kohn, Erhard: *See*—
Colquhoun, Alexander; and Kohn, Erhard, 4,438,445, Cl. 357-14.000.

Koiwai, Yoshihisa: *See*—
Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, 4,437,883, Cl. 75-0.50C.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Iwamoto, Yoshinao; Suzuki, Shizuo; and Shirasaki, Yuichi, 4,438,401, Cl. 324-326.000.

Koland, David G., to Whirlpool Corporation. Vacuum cleaner nozzle lift device. 4,437,205, Cl. 15-354.000.

Kolbl, Richard; and Mehlan, Bernd, to Sielaff GmbH & Co. Coin collection for vending machines. 4,437,557, Cl. 194-1.00D.

Kollmann, Hans-Josef; Hennemann, Lothar; and Hohorst, Wolfgang, to Wago Verwaltungsgesellschaft mit beschrankter Haftung. Connection terminal for electrical conductors. 4,437,721, Cl. 339-97.00P.

Kolodziej, George C.: *See*—
Hinds, James J.; Hoeflich, John C.; and Kolodziej, George C., 4,437,985, Cl. 209-538.000.

Komada, Kenya; and Tan, Yui-Kuan, to Ricoh Company, Ltd. Multi-stylus head. 4,438,444, Cl. 346-155.000.

Komaki, Takao: *See*—
Teraoka, Masanori; Komaki, Takao; and Matsumoto, Seiji, 4,438,333, Cl. 250-327.200.

Komiya, Hiroyoshi: *See*—
Toyoda, Hiroyasu; Komiya, Hiroyoshi; and Itakura, Hideaki, 4,438,315, Cl. 219-121.0PE.

Komori Printing Machinery Co., Ltd.: *See*—
Hasegawa, Kokichi; and Tokita, Tsugio, 4,437,406, Cl. 101-350.000.

Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Image forming apparatus with cleaning means. 4,437,757, Cl. 355-15.000.

Komura, Hirotsugu: *See*—
Ueguri, Shigeo; Komura, Hirotsugu; and Mizuno, Takaji, 4,438,317, Cl. 219-130.510.

Kon, Masaharu: *See*—
Yokoyama, Masao; Kon, Masaharu; and Ota, Hiroshi, 4,437,682, Cl. 280-764.100.

Kondo, Nobuo: *See*—
Tsuchida, Takashi; Kondo, Nobuo; Okada, Kazukiyo; and Okuda, Yutaka, 4,438,425, Cl. 340-55.000.

Kondow, Makoto: *See*—
Tanaka, Chiaki; Nakashima, Shinobu; and Kondow, Makoto, 4,438,240, Cl. 525-420.000.

Koning, Richard W., to Deere & Company. Twine-wrapping mechanism for mechanism for a large round baler. 4,437,399, Cl. 100-4.000.

Konishirokou Photo Industry Co., Ltd.: *See*—
Ishiyama, Shozo, 4,437,732, Cl. 350-427.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hamada, Fumio, 4,438,194, Cl. 430-505.000.
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, 4,438,193, Cl. 430-505.000.

Konno, Kunio: *See*—
Takahashi, Tomowaki; Konno, Kunio; and Sasaya, Toshihiro, 4,437,733, Cl. 350-427.000.

Kono, Yoshio: *See*—
Abe, Haruhiko; Harada, Hiroshi; Denda, Masahiko; Nagasawa, Koichi; and Kono, Yoshio, 4,438,368, Cl. 315-39.000.

Konoplitskaya, Xenya L.: *See*—
Lipatova, Tatyana E.; Vasiichenko, Dmitry V.; Pkhakadze, Georgy A.; and Konoplitskaya, Xenya L., 4,438,249, Cl. 528-61.000.

Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, to Boehringer Ingelheim KG. 1-Aryloxy-3-alkylamino-2-propanols and pharmaceutical compositions containing them. 4,438,143, Cl. 424-304.000.

Koppe, Herbert: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Gaida, Wolfram; and Hoefke, Wolfgang, 4,438,118, Cl. 424-251.000.

Koppers Company, Inc.: *See*—
Calistrat, Michael M., 4,437,847, Cl. 464-74.000.

Koppers, Manfred; Bohnes, Karlheinz; and Kunzer, Heinz, to Bochumer Eisenhutte GmbH & Co. KG. Chain bucket conveyor. 4,437,562, Cl. 198-733.000.

Kopylov, Jury L.: *See*—
Doev, Vitaly S.; Kotelyansky, Iosif M.; Kravchenko, Valery B.; Monosov, Yakov A.; Shakhunov, Valery A.; and Kopylov, Jury L., 4,438,443, Cl. 346-153.100.

Korant, Bruce D.: *See*—
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Kormoczy, Peter: *See*—
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Korner, Gerhard; and Rees, Volker, to BBC Brown, Boveri & Company, Limited. Puffer piston circuit breaker. 4,438,308, Cl. 200-148.00A.

Kornrumpf, William P.: *See*—
Harnden, John D., Jr.; and Kornrumpf, William P., 4,438,396, Cl. 324-127.000.

Korzik, James L.; and Wissman, Thomas, to Paradyne Corporation. Rack mountable primary power AC plug. 4,437,717, Cl. 339-17.0LC.

Koschinek, Gunter: *See*—
Moderlak, Helmut; Koschinek, Gunter; Zinsser, Rolf; Prehler, Richard; and Kretschmann, Bernd, 4,437,827, Cl. 425-378.00S.

Kotani, Kozo: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Ogawa, Tadatoshi; Kotani, Kozo; and Hosono, Hidekazu, 4,438,238, Cl. 525-240.000.

Kotelyansky, Iosif M.: *See*—
Doev, Vitaly S.; Kotelyansky, Iosif M.; Kravchenko, Valery B.; Monosov, Yakov A.; Shakhunov, Valery A.; and Kopylov, Jury L., 4,438,443, Cl. 346-153.100.

Koulbanis, Constantin; N'Guyen, Quang L.; Zabotto, Arlette; and Plot, Josiane, to Societe Anonyme dite: L'Oreal. Mixture of vegetable oils based on jojoba oil and cosmetic compositions comprising the mixture. 4,437,895, Cl. 106-245.000.

Kovach, Stephen M., to Ashland Oil, Inc. Immobilization and neutralization of contaminants in crude oil. 4,437,981, Cl. 208-253.000.

Kovacs, Gabor: *See*—
Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Jozsef; Kekesi, Krisztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter; and Horvath, Karoly, 4,438,132, Cl. 424-285.000.

Kowa Company, Ltd.: *See*—
Watanabe, Isamu; Yamaguchi, Takashi; Kamiya, Kazuhiro; Mori, Toshihito; Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,438,107, Cl. 424-180.000.

Kowada, Ichiro: *See*—
Isomura, Shigenori; Kobayashi, Akio; Kato, Katsushi; Kowada, Ichiro; and Nishii, Sachio, 4,437,446, Cl. 123-492.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Dorr, Wolfgang; Gradel, Gerhard; and Peehs, Martin, 4,438,050, Cl. 264-0.500.
Schnabl, Karl; Hoppner, Eberhard; and Kastl, Hans, 4,438,399, Cl. 324-220.000.

Kramer, James H.; Orndorff, Roy L., Jr.; and Stephens, James M., to B. F. Goodrich Company, The. Riser pipe joint. 4,437,688, Cl. 285-95.000.

Kramer, Kenneth D.; and Fletcher, Edward H., to Deere & Company. Electrohydraulic valve system. 4,437,385, Cl. 91-361.000.

Krampe & Co. Fertigung in Bergbaubedarf GmbH: *See*—
Best, Gerd; and Dlugosch, Gunter, 4,437,707, Cl. 299-81.000.

Krant, Jonathan M.: *See*—
Nir, Aharon; Amiel, Abraham J.; and Krant, Jonathan M., 4,437,263, Cl. 47-1.00R.

Krause, William F., Jr.; and Hopmann, Mark E., to Baker Oil Tools, Inc. Selective lock for anchoring well tools. 4,437,522, Cl. 166-382.000.

Krautkramer-Branson, Inc.: *See*—
Pittaro, Richard J., 4,437,332, Cl. 73-1.0DV.

Kravchenko, Valery B.: *See—*
Doev, Vitaly S.; Kotelyansky, Iosif M.; Kravchenko, Valery B.; Monosov, Yakov A.; Shakhunov, Valery A.; and Kopylov, Jury L., 4,438,443, Cl. 346-153.100.

Kretschmann, Bernd: *See—*
Moderlak, Helmut; Koschinek, Gunter; Zinsser, Rolf; Prehler, Richard; and Kretschmann, Bernd, 4,437,827, Cl. 425-378.00S.

Kretzschmar, Rolf: *See—*
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

Krings, Peter: *See—*
Kuhling, Dieter; Huppertzl Josef; Krings, Peter; and Reuter, Herbert, 4,438,012, Cl. 252-131.000.

Krinski, Thomas L.; and Coco, Charles E., to Ralston Purina Company. Use of soy polysaccharides as a thickening agent for alkali silicate adhesives. 4,437,893, Cl. 106-80.000.

Krishnakumar, Suppayan M.: *See—*
Harry, Ieuan L.; Krishnakumar, Suppayan M.; Jolly, Walter R.; Beck, Martin H.; and Pocock, John F. E., 4,437,825, Cl. 425-145.000.

Kroger, Harry; and Soref, Richard A., to Sperry Corporation. Refractive index temperature sensor. 4,437,761, Cl. 356-44.000.

Krogarud, Harald, to Elkem a/s. Means for an electrothermal smelting furnace. 4,438,516, Cl. 373-97.000.

Krueger, David C.: *See—*
Suh, Kyung W.; Krueger, David C.; and Zehner, Burch E., 4,438,224, Cl. 521-146.000.

Kasyian, Haig. Hand and/or foot propelled vehicle. 4,437,677, Cl. 280-214.000.

Kubo, Daijiro: *See—*
Sano, Jun; Aoyama, Masahide; and Kubo, Daijiro, 4,438,353, Cl. 307-477.000.

Kubo, Katsuro; Fukagawa, Yasuo; and Ishikura, Tomoyuki, to Sanraku-Ocean Co., Ltd. Amidohydrolase having ability to depantothenylate an antibiotic. 4,438,201, Cl. 435-228.000.

Kubo, Kunimichi; Miyazaki, Yasunosuke; Yoshikawa, Mamoru; and Miyoshi, Mituji, to Nippon Oil Company, Ltd. Vapor phase polymerization apparatus for olefins. 4,438,073, Cl. 422-135.000.

Kubo, Masayoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for product transportation in tire-forming machine. 4,437,920, Cl. 156-406.200.

Kubo, Naoki: *See—*
Nakano, Tadashi; Tamura, Hiroyuki; and Kubo, Naoki, 4,438,079, Cl. 423-87.000.

Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Transmission with torque converter and lock up clutch with lubrication and pressurization system. 4,437,358, Cl. 74-867.000.

Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, to Sumitomo Metal Industries, Ltd.; and Nippon Oil Co. Ltd. Process for producing metal powder. 4,437,883, Cl. 75-0.50C.

Kubo, Toshihiko: *See—*
Umino, Masahide; Tamura, Eijiro; Karasuno, Isamu; Ichidate, Minoru; and Kubo, Toshihiko, 4,437,891, Cl. 75-251.000.

Kubodera, Noboru: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, 4,438,115, Cl. 424-250.000.

Kubota, Hitoshi: *See—*
Morita, Katuhiro; and Kubota, Hitoshi, 4,437,310, Cl. 60-562.000.

Kubota, Tatsushi: *See—*
Moriya, Shigeru; Yoshida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Tsuge, Hiroshi, 4,437,683, Cl. 280-804.000.
Moriya, Shigeru; Yoshida, Akio; Matsunami, Muneharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, 4,437,684, Cl. 280-804.000.

Kubotera, Kikuo: *See—*
Kitajima, Masao; Seshimoto, Osamu; Kubotera, Kikuo; and Yamaguchi, Akira, 4,437,970, Cl. 204-412.000.

Kuhling, Dieter; Huppertzl Josef; Krings, Peter; and Reuter, Herbert, to Henkel Kommanditgesellschaft auf Aktien. Stable aqueous suspension of water-insoluble, calcium-binding aluminosilicates and non-ionic suspending agents. 4,438,012, Cl. 252-131.000.

Kuhlman, Ronald H. Controlled exhaust system for low temperature enclosure. 4,437,868, Cl. 62-411.000.

Kuka Schweissanlagen & Roboter GmbH: *See—*
Zimmer, Ernst, 4,438,309, Cl. 219-86.700.

Kulak, Walter. Universal float lure. 4,437,256, Cl. 43-17.500.

Kulesh, Vladimir P.: *See—*
Moskalik, Leonid M.; Ryadchikov, Vladimir E.; Bykov, Anatoly P.; Kulesh, Vladimir P.; Opasov, Stanislav I.; and Orlov, Anatoly A., 4,438,393, Cl. 324-83.00D.

Kulicke & Soffa Industries, Inc.: *See—*
Razon, Ely; and Vilenski, Dan, 4,437,604, Cl. 228-179.000.

Kulik, Alphonse C., to USM Corporation. Method of articulating a work supporting surface. 4,437,198, Cl. 12-145.000.

Kume, Tsutomu: *See—*
Ishii, Yoshiaki; Kume, Tsutomu; Ando, Naoyoshi; and Fujinami, Shosaku, 4,437,416, Cl. 110-245.000.

Kummer, Jan. Milkmeter measuring the weight of the quantity of milk issued by a cow, and device for taking samples adapted for use with said milkmeter. 4,437,346, Cl. 73-221.000.

Kummer, Werner: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,438,143, Cl. 424-304.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Gaida, Wolfram; and Hoefke, Wolfgang, 4,438,118, Cl. 424-251.000.

Kunitz, Friedrich-Wilhelm; and Schranz, Karl-Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Photographic recording material containing a developer compound. 4,438,195, Cl. 430-566.000.

Kunkel, Heinrich: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Horling, Peter; Hetterich, Hermann; and Kunkel, Heinrich, 4,437,214, Cl. 29-149.5DP.

Kunzer, Heinz: *See—*
Koppers, Manfred; Bohnes, Karlheinz; and Kunzer, Heinz, 4,437,562, Cl. 198-733.000.

Kupferdraht-Isolierwerk AG Wildegg: *See—*
Voser, Othmar, 4,438,293, Cl. 174-79.000.

Kurahashi, Masaru: *See—*
Matsui, Kanenobu; Uchiumi, Shinichiro; Takahashi, Mitsuo; Asada, Hideki; and Kurahashi, Masaru, 4,438,041, Cl. 260-464.000.

Kuramochi, Koujiro: *See—*
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,437,358, Cl. 74-867.000.

Kuranishi, Masaaki; and Togo, Yasuhiko, to Sharp Kabushiki Kaisha. Card reader for reading information carried on tag cards. 4,438,328, Cl. 235-181.000.

Kurbjuweit, Hans-Georg: *See—*
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

Kureha Kagaku Kabushiki Kaisha: *See—*
Wagu, Masakatsu; Hayashi, Shoichiro; and Kodama, Kouichi, 4,438,106, Cl. 424-180.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Okada, Yoshio; Terauchi, Takashi; Naoki, Makoto; and Hino, Masatoshi, 4,438,021, Cl. 502-341.000.

Kurt H. Volk, Inc.: *See—*
Volk, Kurt E., Jr.; Herbert, Everett H.; and Stenner, John W., 4,437,852, Cl. 493-216.000.

Kurth, Wilfried: *See—*
Philipp, Helmut; and Kurth, Wilfried, 4,437,370, Cl. 83-23.000.

Kydd, Paul H.: *See—*
Huibers, Derk T. A.; and Kydd, Paul H., 4,437,973, Cl. 208-10.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Tomita, Fusao; Matsuda, Yuzuru; Shirahata, Kunikatsu; Takahashi, Keiichi; Nakano, Hirofumi; Sato, Tomoyasu; Okubo, Shuji; and Nakamura, Nobuo, 4,438,197, Cl. 435-119.000.

Kyushima, Tatsuo: *See—*
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,437,358, Cl. 74-867.000.

Laboratoire d'Etudes et de Recherches Chimiques L.E.R.C.: *See—*
Foissac, Yves; and Hung, Frederic N. B., 4,437,288, Cl. 52-637.000.

LaBruna, Anthony J., to Textron Inc. Positive expulsion fluid storage tanks. 4,437,590, Cl. 222-386.500.

Lafaille, J. Pierre: *See—*
Sanchez, Victor; Espenan, Patrick; Casademont, Ernest; and Lafaille, J. Pierre, 4,437,967, Cl. 204-301.000.

Laing, Karsten; Laing, Oliver; Laing, Nikolaus; and Ludin, Ludwig. Utility water system with a pressureless storage container, particularly for solar installations. 4,437,484, Cl. 137-99.000.

Laing, Nikolaus: *See—*
Laing, Karsten; Laing, Oliver; Laing, Nikolaus; and Ludin, Ludwig, 4,437,484, Cl. 137-99.000.

Laing, Oliver: *See—*
Laing, Karsten; Laing, Oliver; Laing, Nikolaus; and Ludin, Ludwig, 4,437,484, Cl. 137-99.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Barbier, Jean-Paul; and Lerouyer, Gilbert, 4,438,152, Cl. 427-37.000.
Blot, Roger, 4,438,319, Cl. 219-137.0PS.
Guillaume, Paul; and Karinthi, Pierre, 4,437,418, Cl. 110-246.000.

Laity, John L.: *See—*
Graiff, L. B.; and Laity, John L., 4,437,436, Cl. 123-1.00A.

Lallaye, Paul G.; Bjerklie, John W.; and Penty, Robert A., to Hague International. Composite ceramic heat exchange tube. 4,437,217, Cl. 29-157.400.

Lambert, Roger T., to Omnetics, Inc. Flexible pin. 4,437,726, Cl. 339-252.00P.

Landis, Abraham L., to Hughes Aircraft Company. Isoimide containing oligomers. 4,438,273, Cl. 549-303.000.

Lane Company, The: *See—*
Mizelle, Ned W., 4,437,701, Cl. 297-85.000.

Laney, Ralph M. Connector for corrugated tubing. 4,437,691, Cl. 285-353.000.

Lang, Theodore J.; and Kershaw, Bernard J., to Du Pont Canada Inc. Process for coating nylon film with vinylidene chloride copolymers. 4,438,180, Cl. 428-475.800.

Langer, Werner: *See—*
Hittel, Gerhard; Muhl, Hubertus; Eigl, Franz; and Langer, Werner, 4,437,323, Cl. 66-84.00A.

Langstraat, Warren L., to Minnesota Mining and Manufacturing Company. Abrading tool. 4,437,270, Cl. 51-364.000.

Lantero, Oreste J., Jr., to Miles Laboratories, Inc. Immobilization of biocatalysts on granular carbon. 4,438,196, Cl. 435-96.000.

Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Combating arthropods with novel benzyl esters. 4,438,275, Cl. 549-434.000.

Lardon, Hartmut; and Seybold, Guenther, to BASF Aktiengesellschaft. Preparation of sulfides. 4,438,282, Cl. 568-58.000.

Large, George B., to Stauffer Chemical Company. Tri-mixed alkylsulfonium salts of N-phosphonomethylglycine and their use as plant growth regulators and herbicides. 4,437,874, Cl. 71-87.000.

Larose, Andre, to Boreal Hydraulic Equipment. Tree cutting mechanism in a tree harvester. 4,437,500, Cl. 144-34.00R.

Latham, Ronald D., to Fiberglass Unlimited, Inc. Wing type air foil assembly. 4,437,426, Cl. 114-103.000.

Laurenz, Werner, to Pischinger, Franz. Method and apparatus for detecting knocking combustion. 4,437,334, Cl. 73-35.000.

Layton, James W.: *See*—
Canada, James W.; and Layton, James W., 4,437,501, Cl. 144-136.00R.

Leach, Earl A., Jr., to Bendix Corporation, The. Mounting bracket for a transformer. 4,438,421, Cl. 336-65.000.

Leather, Brian B.: *See*—
Ford, Michael A.; and Leather, Brian B., 4,438,329, Cl. 250-459.100.

Lechner, Horst: *See*—
Gruber, Peter; Schmid, Jochen; Lechner, Horst; and Bauer, Eckhart, 4,438,091, Cl. 424-21.000.

Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, to Societe Vetrotex Saint-Gobain. Method and apparatus for multifilament glass strand. 4,437,869, Cl. 65-1.000.

Lee, Chung J., to Plastics Engineering Company. Fast crystallizing polyalkyleneterephthalate resin compositions. 4,438,233, Cl. 524-299.000.

Lee, Garland G.: *See*—
Rosenquist, Niles R.; and Lee, Garland G., 4,438,234, Cl. 524-378.000.

Lee, Ivan S., to Polysar Limited. Carboxylated acrylate styrene butadiene adhesives. 4,438,232, Cl. 524-272.000.

Lee, Len F.: *See*—
Howe, Robert K.; and Lee, Len F., 4,437,875, Cl. 71-90.000.
Howe, Robert K.; and Lee, Len F., 4,437,876, Cl. 71-90.000.

Lee, Robert D., to Motorola, Inc. Single stage operational amplifier voltage reference. 4,438,388, Cl. 323-313.000.

Leer Manufacturing Company, Inc.: *See*—
Trautsch, Jerrold A., 4,437,412, Cl. 108-56.100.

Lefebvre, Kenneth E.: *See*—
Goebel, Mark B.; and Lefebvre, Kenneth E., 4,437,689, Cl. 285-246.000.

Legille, Edouard: *See*—
Ulveling, Leon; Legille, Edouard; and Boever, Jean, 4,437,796, Cl. 406-23.000.

Lehmann, Hans D.: *See*—
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

Leiber, Heinz; and Stegmeier, Alwin, to Robert Bosch GmbH. Electromagnetic activation device. 4,438,420, Cl. 335-275.000.

Leisterer, Reinhard: *See*—
Arens, Egidius; Hampe, Christoph; Karlowsky, Ingo; Meyersieck, Manfred; Schwarz, Hans D.; Anding, Norbert; and Leisterer, Reinhard, 4,438,438, Cl. 343-451.000.

Lelong, Pierre H.: *See*—
Jatteau, Michel; Lelong, Pierre H.; and Pergrale, Jean, 4,438,334, Cl. 250-363.00S.

Lemelson, Jerome H. Measuring instrument and method. 4,437,241, Cl. 33-166.000.

Leon, Thomas B.; and Arpin, Michael D. Illuminating device. 4,438,482, Cl. 362-103.000.

Leong, Sai: *See*—
Gantwerker, Scott; and Leong, Sai, 4,438,150, Cl. 426-625.000.

Lermann, Peter: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; Lermann, Peter; Wagner, Karl; and Zobel, Siegfried, 4,437,751, Cl. 354-214.000.

Lerner, Bernard J. Removal of undesired components from gases. 4,437,867, Cl. 55-233.000.

Lerouyer, Gilbert: *See*—
Barbier, Jean-Paul; and Lerouyer, Gilbert, 4,438,152, Cl. 427-37.000.

Leuenberger, Claude-Eric: *See*—
Dinger, Rudolf; Michel, Jean-Georges; and Leuenberger, Claude-Eric, 4,437,773, Cl. 374-117.000.

Leuven Research & Development V.Z.W.: *See*—
Delaey, Lucas J., 4,437,911, Cl. 148-402.000.

Lever Brothers Company: *See*—
Huber, Otto, 4,438,015, Cl. 252-174.240.
Verhagen, Laurentius A. M.; and Bodor, Janos, 4,438,149, Cl. 426-603.000.

Levine, Alfred B. Multiplex photocopier system with portable scanner. 4,438,459, Cl. 358-258.000.

Levine, Peter A.; and Limberg, Allen L., to RCA Corporation. Electrical compensation for misregistration of striped color filter in a color imager with discrete sampling elements. 4,437,764, Cl. 358-44.000.

Lewis, David L., to Bendix Corporation, The. High torque chuck assembly and collet. 4,437,801, Cl. 409-232.000.

Lewis, Mack A.; and Spencer, Mike R., to Wilson Trailer Co. Monocoque trailer or body side construction. 4,437,699, Cl. 296-181.000.

Liao, Hsiang P.: *See*—
Finley, Joseph H.; and Liao, Hsiang P., 4,438,048, Cl. 260-982.000.

Liberman, Arthur L.: *See*—
Lindauer, Jerome I.; Hill, Ira D.; and Liberman, Arthur L., 4,438,010, Cl. 252-91.000.

Lichtenegger, Siegried, to U.S. Philips Corporation. Detector for an electron microscope. 4,438,332, Cl. 250-310.000.

Lillo, Renaldo C. Sliding door with security apparatus. 4,437,694, Cl. 292-235.000.

Limberg, Allen L.: *See*—
Levine, Peter A.; and Limberg, Allen L., 4,437,764, Cl. 358-44.000.

Limburg, William R.: *See*—
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.

Lindauer, Jerome I.; Hill, Ira D.; and Liberman, Arthur L., to International Flavors & Fragrances Inc. Soap tablet including perfume-containing plastic core and process for preparing same. 4,438,010, Cl. 252-91.000.

Linden, Jeffrey L., Sr.: *See*—
Chuang, Patrick T.; Keswick, Paul D.; and Linden, Jeffrey L., Sr., 4,438,346, Cl. 307-297.000.

Lindenschmidt, Gerhard: *See*—
Brandstetter, Franz; Hambrecht, Juergen; Jung, Rudolf H.; and Lindenschmidt, Gerhard, 4,438,237, Cl. 525-183.000.

Linder, Ernst: *See*—
Babitzka, Rudolf; and Linder, Ernst, 4,438,363, Cl. 310-328.000.

Linderman, Noel. Yoke apparatus. 4,437,709, Cl. 308-219.000.

Lindorfer, Walter; Wagner, Fritz; and Schulz, Walther, to Wintershall AG; and Gesellschaft fur Biotechnologische Forschung mbH. Prevention of penetration of oily hydrocarbons into sand. 4,437,993, Cl. 210-631.000.

Linke, Horst: *See*—
Redder, Manfred; Linke, Horst; Grundken, Dieter; and Temme, Helmut, 4,437,564, Cl. 198-834.000.

Lion Corporation: *See*—
Satsuki, Teruhisa; Ota, Seiiti; and Tabata, Setsuko, 4,438,025, Cl. 252-545.000.

Lipatova, Tatyana E.; Vasiichenko, Dmitry V.; Pkhakadze, Georgy A.; and Konoplitskaya, Xenya L. Biodegradable polyurethane urea acyl semicarbazides for the manufacture of biodegradable alloimplants. 4,438,249, Cl. 528-61.000.

Lippmann, Hans-Joachim; Peche, Gerhard; and Bettge, Hans, to Siemens Aktiengesellschaft. Electric vacuum switch. 4,438,307, Cl. 200-144.00B.

Liquipak International, Inc.: *See*—
Pankratz, Lawrence A.; and Cornica, Donald G., 4,437,498, Cl. 141-89.000.

Liu, Henry; Gibson, Donald L.; Cheng, David H. S.; and Rathke, James E., to University of Missouri, The Curators of the. Pipeline transportation system. 4,437,799, Cl. 406-198.000.

Liu, Ping Y., to General Electric Company. High impact strength, flame retardant polycarbonate composition. 4,438,231, Cl. 524-161.000.

Lobel, Wilfried: *See*—
Banke, Karl-Heinz; Hering, Elisabeth; Lobel, Wilfried; Pollack, Dieter; Wiedemann, Gunter; Grell, Ute; and Schuler, Ingo, 4,438,053, Cl. 264-25.000.

Lockheed Corporation: *See*—
Marmon, Frank E., 4,437,487, Cl. 137-322.000.

Lockhoff, Oswald: *See*—
Petersen, Uwe; Stadler, Peter; Lockhoff, Oswald; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,438,260, Cl. 536-13.900.

Lockwood Technical Inc.: *See*—
Taggart, Thomas D.; and Taggart, Robert E., 4,437,488, Cl. 137-334.000.

Lomas, David A.: *See*—
Vickers, Anthony G.; and Lomas, David A., 4,438,071, Cl. 422-109.000.

Londos, Rene; and Barbereau, Jean-Luc, to Compagnie Generale de Manutention et de Stockage. Apparatus for causing a unit guided on rectilinear rails to move gradually and a forklift equipped with such a unit. 4,437,808, Cl. 414-667.000.

Long, William B.: *See*—
Eaby, Daniel G.; Long, William B.; and Shuey, John R., 4,437,725, Cl. 339-156.00R.

Lonnstrom Oy: *See*—
Vatja, Aulis, 4,437,565, Cl. 198-851.000.

Lord, Douglas W., to Renfro, Julian C. Partially restrained arrangement for the mast and sail of a craft possessing inherent stability. 4,437,424, Cl. 114-91.000.

"L'Oreal": *See*—
Gueret, Jean-Louis H., 4,437,477, Cl. 132-88.500.
Saint-Leger, Didier J.; and Abrioux, Andre, 4,438,205, Cl. 436-71.000.

Lorenz, Max R.: *See*—
Homola, Andrew M.; and Lorenz, Max R., 4,438,156, Cl. 427-57.000.

Louis, Pierre A. G. Support device for helping a person to get out of a bathtub. 4,437,196, Cl. 4-564.000.

Low, Robert N.: *See*—
Cloutier, Frank L.; Low, Robert N.; and McClelland, Paul H., 4,438,191, Cl. 430-324.000.

Lucas Industries Limited: *See*—
Farr, Glyn P. R., 4,437,483, Cl. 137-85.000.

Harmer, George A., 4,437,547, Cl. 188-1.110.
Luchetti, Stephen J.: *See—*
Abu-Shumays, Ahmad; Helmer, John C.; and Luchetti, Stephen J., 4,437,812, Cl. 417-53.000.
Ludin, Ludwig: *See—*
Laing, Karsten; Laing, Oliver; Laing, Nikolaus; and Ludin, Ludwig, 4,437,484, Cl. 137-99.000.
Lynn, Vicki A.: *See—*
Archer, Wesley L.; Lynn, Vicki A.; and Dallessandro, Susan M., 4,438,192, Cl. 430-329.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Fischer, Hermann, 4,437,402, Cl. 101-181.000.
Greiner, Harry M., 4,437,403, Cl. 101-248.000.
Mac Valves, Inc.: *See—*
Neff, James A., 4,438,418, Cl. 335-255.000.
Macaleese, John E., to Stebbins Engineering and Manufacturing Co. Thermally insulated tank structure and method for forming the same. 4,437,279, Cl. 52-247.000.
MacCarthy, Patrick. Yo-yo with twist-resistant string. 4,437,261, Cl. 46-61.000.
MacCraven, Joseph, to Southwire Company. Method for improved heat treatment of elongated aluminum alloy materials. 4,437,904, Cl. 148-13.100.
MacFarland, James M.; and Kappe, Bernard W., to United States of America, Air Force. Inflatable, inert gas-purged, welding chamber. 4,437,710, Cl. 312-1.000.
Machida, Yoshihiro: *See—*
Mizukami, Hidekatu; and Machida, Yoshihiro, 4,437,759, Cl. 355-91.000.
MacMillan Bloedel Limited: *See—*
Gilroy, Alfred A., 4,437,611, Cl. 239-453.000.
Macnak, Philip P.: *See—*
Smoot, George W.; and Macnak, Philip P., 4,438,433, Cl. 340-825.440.
Madden, James A., to General Electric Company. Method and apparatus for circumferentially grooving thin-walled cylindrical metal objects. 4,437,327, Cl. 72-94.000.
Madey, John M. J.: *See—*
Elias, Luis R.; Madey, John M. J.; and Smith, Todd I., 4,438,513, Cl. 372-2.000.
Madonna, Peter L.: *See—*
O'Hanlon, Tom A.; Madonna, Peter L.; and Wallace, Gearld F., 4,437,525, Cl. 175-218.000.
Maeda Industries, Ltd.: *See—*
Ozaki, Nobuo; and Hosokawa, Mikio, 4,437,357, Cl. 74-475.000.
Magarian, Gerald M.; and Friedrich, Ralph S., to Ameron, Inc. Winding fiber reinforced pipe fittings. 4,437,616, Cl. 242-7.020.
Magariyama, Kenichi: *See—*
Terui, Nobuhiko; and Magariyama, Kenichi, 4,437,744, Cl. 354-442.000.
Magee, Dennis A.; and McCubbin, Charles E., to Dunham-Bush, Inc. Variable volume positive displacement rotary pump. 4,437,816, Cl. 417-465.000.
Magerlein, Helmut: *See—*
Zengel, Hans-Georg; Kersten, Hilde; and Magerlein, Helmut, 4,437,960, Cl. 204-181.00C.
Magome, Tamotsu: *See—*
Sakurayama, Junichi; and Magome, Tamotsu, 4,437,755, Cl. 355-10.000.
Maguire, Paul R., to Pleion Corporation. Modular wall panel fastener assembly. 4,437,286, Cl. 52-506.000.
Mahadev, Kalabeerappa N.: *See—*
Boorman, Philip M.; Chivers, Tristram; Tavares, Donald F.; and Mahadev, Kalabeerappa N., 4,438,218, Cl. 502-220.000.
Maheo, Jean Y.: *See—*
Colineau, Joseph; and Maheo, Jean Y., 4,438,375, Cl. 315-408.000.
Malinowaki, Christopher W.; and Rinderle, Heinz, to Telefunken Electronic GmbH. Oscillator frequency control loop. 4,438,412, Cl. 331-2.000.
Mallik, Arjun; Koetters, Daniel; and Edelstein, Harold, to Allied Corporation. Scintillation liquid compatible with high performance liquid chromatography solvents. 4,438,017, Cl. 252-301.170.
Mallinckrodt, Inc.: *See—*
Mosier, Larry D., 4,438,209, Cl. 436-542.000.
Mampaeij, Johannes J. Break bollard. 4,437,427, Cl. 114-218.000.
Manber, Solomon: *See—*
Chiang, David; Chu, Mosi; and Manber, Solomon, 4,438,379, Cl. 318-685.000.
Manchem, Limited: *See—*
Holland, Frank S., 4,437,949, Cl. 204-59.00M.
Mandai, Masaaki: *See—*
Shida, Masaharu; Ueda, Makoto; Otawa, Shuji; Mandai, Masaaki; and Sato, Katsuhiko, 4,437,769, Cl. 368-204.000.
Manera, Maxime: *See—*
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, 4,437,869, Cl. 65-1.000.
Mangels, Ralph W. Self-inflating bedpan. 4,437,195, Cl. 4-456.000.
Mangin, Pierre M.: *See—*
Durand, Daniel C.; and Mangin, Pierre M., 4,438,019, Cl. 502-169.000.
Mankouski, Charles: *See—*
Pardee, Ernest, 4,437,545, Cl. 182-171.000.
Manson, Harry G., to IMC Magnetics Corp. Stepper motor having rotor with limited axial movement. 4,438,361, Cl. 310-90.000.
Manville Service Corp.: *See—*
Graser, Earl J., 4,437,606, Cl. 229-40.000.
Marchadour, Jean-Charles. Machine for crimping in a controlled atmosphere. 4,437,290, Cl. 53-97.000.
Marchetti, Mauro: *See—*
Botteghi, Carlo; Gladiali, Serafino G.; Marchetti, Mauro; and Faedda, Giovanni A., 4,438,033, Cl. 260-239.55C.
Mardkha, Michael M., to Xerox Corporation. TTL Compatible CMOS input buffer. 4,438,352, Cl. 307-475.000.
Marhold, Albrecht: *See—*
Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,438,275, Cl. 549-434.000.
Marinoff, Gerald P.; and Teague, W. Dorwin, to Marinoff, Gerald P. Fire escape device. 4,437,546, Cl. 182-233.000.
Mark Products, Inc.: *See—*
Woodall, James C., 4,438,292, Cl. 174-52.00R.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Heat resistant polyarylates. 4,438,241, Cl. 525-444.000.
Marken, John P. Wave power generator. 4,438,343, Cl. 290-53.000.
Marklow, Raymond J.: *See—*
Carroll, William G.; Farley, Peter; and Marklow, Raymond J., 4,438,252, Cl. 528-75.000.
Marmon, Frank E., to Lockheed Corporation. Lightning protected check-type drain valve. 4,437,487, Cl. 137-322.000.
Marquard, John F.: *See—*
Cary, Hall; and Marquard, John F., 4,437,619, Cl. 242-75.510.
Martens, Wilhelm; and Dilmaghani, Homayoun, to Vereinigte Flugtechnische Werke Fokker GmbH. Drive for leading edge flaps of aircraft wings. 4,437,631, Cl. 244-214.000.
Martin, Clovis L., to Acos Finos Piratini S.A.; and Metallgesellschaft Aktiengesellschaft. Method of and apparatus for measuring the rate at which gases are blown into a rotary kiln. 4,437,835, Cl. 432-103.000.
Martin, Henry: *See—*
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,437,879, Cl. 71-96.000.
Martin, Kenneth L.: *See—*
Woodard, Thomas R.; and Martin, Kenneth L., 4,438,320, Cl. 219-216.000.
Martinmaas, Werner W. Nut wrench. 4,437,364, Cl. 81-179.000.
Martorana, Richard T., to United States of America, Navy. Heat pipe control apparatus. 4,437,510, Cl. 165-32.000.
Maruo, Tsunehiro; and Inagaki, Masaomi, to Sony Corporation. Position detecting signal generator. 4,438,398, Cl. 324-173.000.
Maruyama, Toshinori: *See—*
Akita, Yoshio; Maruyama, Toshinori; and Muto, Katsuya, 4,438,384, Cl. 320-48.000.
Marwil, Stanley J., to Phillips Petroleum Company. Separation of hydrocarbon and alcohol azeotropic mixtures by distillation with anhydrous ammonia. 4,437,941, Cl. 203-50.000.
Masarky, N. Henri: *See—*
Hawryluk, Raymond; Johnson, Clyde R.; and Masarky, N. Henri, 4,437,884, Cl. 75-7.000.
Masonite Corporation: *See—*
Slocum, Donald H.; Schairbaum, Albert W.; and Curtis, William M., 4,437,274, Cl. 52-105.000.
Massachusetts Institute of Technology: *See—*
Saltzer, Jerome H., 4,438,520, Cl. 375-4.000.
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, to Taiyo Yuden Co., Ltd. Semiconductive ceramic materials with a voltage-dependent nonlinear resistance, and process for preparation. 4,438,214, Cl. 501-136.000.
Mathais, Henri; Commandeur, Raymond; Pontoglio, Achille; and Nebel, Sergio, to PCUK Produits Chimiques Ugine Kuhlmann. Chlorinated alkylaromatic based compounds and new liquid dielectrics. 4,438,027, Cl. 252-581.000.
Matsuda, Yuzuru: *See—*
Tomita, Fusao; Matsuda, Yuzuru; Shirahata, Kunikatsu; Takahashi, Keiichi; Nakano, Hirofumi; Sato, Tomoyasu; Okubo, Shuji; and Nakamura, Nobuo, 4,438,197, Cl. 435-119.000.
Matsufuji, Akihiro: *See—*
Umemura, Shizuo; Matsufuji, Akihiro; Aonuma, Masashi; Kitamoto, Tatsuji; and Miyatsuka, Hajime, 4,437,882, Cl. 75-0.50R.
Matsui, Kanenobu; Uchiumi, Shinichiro; Takahashi, Mitsuo; Asada, Hideki; and Kurahashi, Masaru, to UBE Industries, Ltd. Process for preparing esters of cyanoacetic acids. 4,438,041, Cl. 260-464.000.
Matsumoto, Fumio: *See—*
Mori, Kensuke; Matsumoto, Hiromi; Suga, Yozo; Nakayama, Tadashi; and Matsumoto, Fumio, 4,437,909, Cl. 148-111.000.
Nozawa, Tadao; Yamamoto, Takaaki; Nakayama, Tadashi; Matsumoto, Fumio; and Hayami, Satohiro, 4,437,910, Cl. 148-112.000.
Matsumoto, Hiromi: *See—*
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Matsumoto, Hiroshi: *See—*
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,437,877, Cl. 71-90.000.
Matsumoto, Seiji: *See—*
Teraoka, Masanori; Komaki, Takao; and Matsumoto, Seiji, 4,438,333, Cl. 250-327.200.
Matsumoto, Toyosaku, to Nippon Gakki Seizo Kabushiki Kaisha. Disk player system having a disk sucking function. 4,438,510, Cl. 369-271.000.
Matsunaga, Isao: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, 4,438,115, Cl. 424-250.000.

Matsunami, Muneharu: *See*—
Moriya, Shigeru; Yoshida, Akio; Matsunami, Muneharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, 4,437,684, Cl. 280-804.000.

Matsuo, Hideo: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Kelzo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,438,155, Cl. 427-49.000.

Matsuo, Masaaki: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, 4,438,126, Cl. 424-272.000.

Matsuo, Masashi: *See*—
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Araki, Shigeru; Taki, Yasuo; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,437,232, Cl. 29-740.000.
Sakakima, Hiroshi; Satomi, Mitsuo; Senno, Harufumi; and Hirota, Eiichi, 4,437,912, Cl. 148-403.000.
Sato, Takeshi, 4,438,529, Cl. 455-190.000.

Matsuyama, Kouszou, to Tokyo Shibaura Denki Kabushiki Kaisha. Power supplying apparatus. 4,438,478, Cl. 361-152.000.

Matsuyama, Masahiro: *See*—
Nojiri, Tadao; Kanemaru, Kenji; Nishikawa, Takayoshi; Matsuyama, Masahiro; and Ito, Yoji, 4,438,422, Cl. 340-52.00F.

Matsuyama, Yoshihiro: *See*—
Kawai, Kazumichi; Kaneko, Yasuo; Abe, Kelzo; Matsuo, Hideo; Kishi, Yoshinori; Miyake, Yasuhiko; and Matsuyama, Yoshihiro, 4,438,155, Cl. 427-49.000.

Mattei, Anthony, to RCA Corporation. Automatically adaptive transversal filter. 4,438,521, Cl. 375-16.000.

Matyas, Tibor: *See*—
Stoller, David A., Jr.; Robertson, James C.; and Matyas, Tibor, 4,437,410, Cl. 105-378.000.

Maxwell, Ronald M., to General Equipment Manufacturers. Multi-position student table. 4,437,411, Cl. 108-1.000.

Mayne, Sherman T., to Gram Research & Development Co. Method of treating contaminated insoluble organic solid material. 4,437,999, Cl. 210-748.000.

Mazzurco, Anthony; and Miller, Richard L., to Mazzurco, Anthony. Self-orientating fluid container device. 4,437,636, Cl. 248-137.000.

McAnespie, Don: *See*—
Russ, Stephen; and McAnespie, Don, 4,437,612, Cl. 239-556.000.

McAvoy, Thomas R., to Minnesota Mining and Manufacturing Company. Surface treating pad having a renewable surface. 4,437,271, Cl. 51-400.000.

McCarthy, Harry E.: *See*—
Cha, Chang Y.; and McCarthy, Harry E., 4,437,519, Cl. 166-259.000.

McClelland, Paul H.: *See*—
Cloutier, Frank L.; Low, Robert N.; and McClelland, Paul H., 4,438,191, Cl. 430-324.000.

McClenahan, Charles R., to United States of America, Air Force. Current transformer high voltage probe utilizing copper sulfate water resistor. 4,438,395, Cl. 324-127.000.

McCormick, Michael A.; and Gladdish, Peter, to Rolls-Royce Limited. Signal processing means acting as a frequency range translator and as a filter. 4,438,406, Cl. 328-167.000.

McCubbin, Charles E.: *See*—
Magee, Dennis A.; and McCubbin, Charles E., 4,437,816, Cl. 417-465.000.

McCue, John P., to Philip Morris Industrial Incorporated. Electrosensitive recording materials with heterogeneous surface topology. 4,438,170, Cl. 428-207.000.

McEuen, Bruce K.; and Norris, Robert D., to FMC Corporation. Process for oxidizing thallium (I) to thallium (III). 4,438,080, Cl. 423-112.000.

McGrann, Harold J.; Orn, John F.; and Pallaver, Matthew C., to Sperry Corporation. Control stick force transducer. 4,437,351, Cl. 73-862.050.

McGraw, Isaac R., to Pennwalt Corporation. Use of clotrimazole to treat herpes labialis. 4,438,129, Cl. 424-273.00R.

McGraw, Isaac R., to Pennwalt Corporation. Use of tolnaftate to treat herpes labialis. 4,438,134, Cl. 424-300.000.

McGraw, Thomas F. Continuous trickle-down distillation unit for producing hydrated alcohol. 4,437,937, Cl. 202-160.000.

McHugh, James D., to General Electric Company. Low axial stiffness thrust bearing. 4,438,339, Cl. 290-1.00R.

McIver, Chandler H., to Honeywell Information Systems Inc. Integrated circuit package. 4,437,235, Cl. 29-840.000.

McKeen, Jeffrey A.: *See*—
Bronsky, Robert J.; Clark, Dennis B.; McKeen, Jeffrey A.; and Przybylski, William A., 4,437,347, Cl. 73-272.00R.

McKerihen, Steven J.: *See*—
Brooker, Michael F. C.; McKerihen, Steven J.; Attwala, Hashmukrai D.; and Cautillo, Antonio L., 4,437,831, Cl. 431-177.000.

McMaster, Harold A.; Nitschke, Norman C.; and Nitschke, John S. Apparatus and method for bending glass sheets. 4,437,871, Cl. 65-104.000.

McMaster, Harold A.; Nitschke, Norman C.; and Nitschke, John S. Apparatus for bending and tempering glass sheets. 4,437,872, Cl. 65-104.000.

McMullen, John K. Pump, and an apparatus incorporating the pump for infusing liquid medicine. 4,437,815, Cl. 417-418.000.

McVeigh, Harry A.: *See*—
Chester, Arthur W.; McVeigh, Harry A.; and Stover, William A., 4,437,978, Cl. 208-120.000.

MDC Max Datwyler AG: *See*—
Datwyler, Max, 4,437,942, Cl. 204-6.000.

Mead Johnson & Company: *See*—
Allen, Lloyd E.; and Riblet, Leslie A., 4,438,119, Cl. 424-251.000.

Mederer, Gerhard. Reciprocating piston engine. 4,437,438, Cl. 123-48.00B.

Medical Engineering Corporation: *See*—
Trick, Robert E.; and Weeks, Vaughan B., 4,437,457, Cl. 128-1.00R.

Medtronic, Inc.: *See*—
Sorenson, Paul D.; and Dickson, Dale A., 4,437,468, Cl. 128-660.000.
White, David L., 4,437,475, Cl. 128-785.000.

Meeder, Raymond L., to Siemens Gammasonics, Inc. Detector head mounting apparatus. 4,438,335, Cl. 250-363.00S.

Mehlan, Bernd: *See*—
Kolbl, Richard; and Mehlan, Bernd, 4,437,557, Cl. 194-1.00D.

Meister, Alton; and Williamson, Joanne M., to Cornell Research Foundation, Inc. Cysteine delivery system. 4,438,124, Cl. 424-270.000.

Meltsch, Hans J.; and Rost, Jan, to Siemens Aktiengesellschaft. Cable sleeve with an entrance socket of shrinkable material. 4,438,294, Cl. 174-88.00R.

Memmi, Massimo: *See*—
Bruno, Roberto; and Memmi, Massimo, 4,437,944, Cl. 204-27.000.

Menioux, Claude C. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Rotary alternating piston gas generator. 4,437,441, Cl. 123-213.000.

Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, to Schott Glaswerke. Optical and ophthalmic glass with refractive indices $nd > 1.58$, Abbe numbers > 45 and densities < 2.75 g/cm^3. 4,438,211, Cl. 501-65.000.

Meny, Allan H.; and Palmer, Dennis L. Protecting means. 4,437,793, Cl. 405-212.000.

Merck & Co., Inc.: *See*—
Hartman, George D., 4,438,266, Cl. 544-350.000.
Smith, Robert L., 4,438,123, Cl. 424-270.000.

Merkl, Bernard A.: *See*—
Christman, Donald L.; and Merkl, Bernard A., 4,438,248, Cl. 528-57.000.

Merrell Dow Pharmaceuticals Inc.: *See*—
Sjoerdsma, Albert, 4,437,873, Cl. 71-67.000.

Merrell Toraude et Compagnie: *See*—
Bey, Philippe; and Jung, Michel, 4,438,270, Cl. 546-243.000.

Merrigan, Michael A., to United States of America, Energy. Heat collector. 4,437,456, Cl. 126-433.000.

Mertz, Frank D., to Red-Ray Manufacturing Company, Inc. Infrared radiating burner article. 4,437,833, Cl. 431-329.000.

Merz, Johann, to Zahnradfabrik Friedrichshafen, AG. Controllable vane pump. 4,437,819, Cl. 418-26.000.

Mesdan S.p.A.: *See*—
Truzzi, Ferdinando; and Premi, Mauro, 4,437,298, Cl. 57-22.000.
Truzzi, Ferdinando; and Premi, Mauro, 4,437,299, Cl. 57-22.000.

Mesta Machine Company: *See*—
Petros, Andrew J., 4,437,223, Cl. 29-564.300.

Metallgesellschaft AG: *See*—
Pietsch, Hartmut; Turke, Wolfgang; Bareuther, Ernst; Kampf, Fritz; and Bings, Hubert, 4,438,076, Cl. 423-30.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Martin, Clovis L., 4,437,835, Cl. 432-103.000.

Metz, Bruce E., to Athena Controls Inc. Seam sealing device and technique. 4,437,853, Cl. 493-302.000.

Metz, Manfred: *See*—
Huber, Willi; and Metz, Manfred, 4,437,610, Cl. 239-119.000.

Metzelder, Wolfgang, to Friedrich Wilh. Schwing GmbH. Two cylinder viscous material pump. 4,437,817, Cl. 417-507.000.

Metzger, Karl G.: *See*—
Boberg, Michael; Habich, Dieter; Metzger, Karl G.; and Naab, Paul, 4,438,114, Cl. 424-248.510.
Petersen, Uwe; Stadler, Peter; Lockhoff, Oswald; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,438,260, Cl. 536-13.900.

Meuleman, Dirk G.: *See*—
Sanders, Adrianus L. M.; Meuleman, Dirk G.; Moelker, Huibert C. T.; van Dedem, Gijsbert W. K.; and van Houdenhoven, Francois E. A., 4,438,108, Cl. 424-183.000.

Meyer, Victor E.; and Dergazarian, Thomas E., to Dow Chemical Company, The. (Vinylaryl)alkyl polysulfide polymers. 4,438,259, Cl. 528-388.000.

Meyersieck, Manfred: *See*—
Arens, Egidius; Hampe, Christoph; Karlowsky, Ingo; Meyersieck, Manfred; Schwarz, Hans D.; Anding, Norbert; and Leisterer, Reinhard, 4,438,438, Cl. 343-451.000.

Michaud, Paul: *See*—
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Michel, Jean-Georges: *See*—
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Michigan Consolidated Gas Company: *See*—
Bronsky, Robert J.; Clark, Dennis B.; McKeen, Jeffrey A.; and Przybylski, William A., 4,437,347, Cl. 73-272.00R.

Mick, John R.: *See*—
Harmon, William J., Jr.; Mick, John R.; and Coleman, Vernon, 4,438,492, Cl. 364-200.000.

Midland-Ross Corporation: *See*—
Russ, Stephen; and McAnespie, Don, 4,437,612, Cl. 239-556.000.
Miles Laboratories, Inc.: *See*—
Lantero, Oreste J., Jr., 4,438,196, Cl. 435-96.000.
Miller, Harold W.: *See*—
Kerns, Quentin A.; and Miller, Harold W., 4,438,367, Cl. 315-5.410.
Miller, Richard L.: *See*—
Mazzurco, Anthony; and Miller, Richard L., 4,437,636, Cl. 248-137.000.
Miller, Roger A., to Corning Glass Works. Optical waveguide fiber cooler. 4,437,870, Cl. 65-12.000.
Miller, Ronald L. Geometric game. 4,437,667, Cl. 273-153.00S.
Miller, Scott W.: *See*—
Schwartz, Lionel H.; Miller, Scott W.; and Severud, Christopher N., Jr., 4,438,479, Cl. 361-213.000.
Miller, Stewart E.: *See*—
Copeland, John A., III; and Miller, Stewart E., 4,438,447, Cl. 357-19.000.
Milliken Research Corporation: *See*—
Eschenbach, Paul W.; and Goineau, Andre M., 4,437,301, Cl. 57-289.000.
Milnes, Kenneth B. Carpet seaming tape activator. 4,438,323, Cl. 219-243.000.
Milsmann, Manfred: *See*—
Weder, Hans G.; Zumbuhl, Otmar; Schwendener, Reto; and Milsmann, Manfred, 4,438,052, Cl. 264-4.600.
Minakata, Matsuo: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,437,324, Cl. 68-5.00E.
Minami, Ryohei; Okamura, Shozo; Sunami, Yoshihiko; Hosoi, Takuji; and Kanou, Takuo, to Sumitomo Metal Industries, Ltd. Coal liquefaction process. 4,437,974, Cl. 208-10.000.
Minatelli, John A.: *See*—
Bell, Allyn R.; Doweyko, Arthur M. P.; and Minatelli, John A., 4,438,271, Cl. 546-294.000.
Minemura, Norihiro: *See*—
Yamaguchi, Taturo; and Minemura, Norihiro, 4,438,151, Cl. 427-36.000.
Minnesota Mining and Manufacturing Company: *See*—
Langstraat, Warren L., 4,437,270, Cl. 51-364.000.
McAvoy, Thomas R., 4,437,271, Cl. 51-400.000.
Minolta Camera Kabushiki Kaisha: *See*—
Taniguchi, Nobuyuki, 4,437,742, Cl. 354-21.000.
Mintus, Raymond E.: *See*—
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Miracle Products, Inc.: *See*—
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Misawa, Yoshihiko: *See*—
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Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, to Toda Kogyo Corp. Acicular ferromagnetic alloy particles and process for producing said particles. 4,437,881, Cl. 75-0.5AA.
Misumi, Kiyohito: *See*—
Furukawa, Mitsuhiki; Miyahara, Michito; Kitahira, Takashi; Misumi, Kiyohito; Shiroyama, Masaharu; and Wada, Toshiaki, 4,438,213, Cl. 501-92.000.
Mita Industrial Co. Ltd.: *See*—
Fushida, Akira; and Kato, Yoshiaki, 4,438,187, Cl. 430-81.000.
Mitarai, Tsuyoshi; and Sato, Kunio, to Casio Computer Co., Ltd. Digital electronic musical instrument. 4,437,377, Cl. 84-1.010.
Mitomo, Mamoru; Moriyoshi, Yusuke; Sakai, Toshikazu; and Osaka, Toshiaki, to National Institute for Researches in Inorganic Materials. Process for producing a translucent β-sialon sintered product. 4,438,051, Cl. 264-1.200.
Mitsubishi Chemical Industries, Limited: *See*—
Ohta, Takayuki; Yanaga, Yukio; and Hino, Seiichi, 4,438,256, Cl. 528-188.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Abe, Haruhiko; Harada, Hiroshi; Denda, Masahiko; Nagasawa, Koichi; and Kono, Yoshio, 4,438,368, Cl. 315-39.000.
Kawai, Jyoji, 4,438,487, Cl. 363-129.000.
Ogawa, Hitoshi, 4,437,821, Cl. 418-104.000.
Ueguri, Shigeo; Komura, Hirotsugu; and Mizuno, Takaji, 4,438,317, Cl. 219-130.510.
Mitsubishi Gas Chemical Co., Ltd.: *See*—
Miyamoto, Akira; Shimizu, Senzo; Harada, Masahiro; Ajiro, Tamotu; and Hara, Hideki, 4,438,257, Cl. 528-347.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Kubo, Masayoshi, 4,437,920, Cl. 156-406.200.
Mitsubishi Kakoki Kaisha Ltd.: *See*—
Nagatsuka, Kenichi, 4,437,202, Cl. 15-320.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Miwa, Naoto; and Nakajima, Hiroshi, 4,438,199, Cl. 435-190.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Kashiwa, Norio; Morita, Yoshinori; and Suga, Michiharu, 4,438,243, Cl. 526-125.000.
Miura, Hirohisa; Satou, Hiroshi; and Natsume, Toshio, to Toyota Jidosha Kabushiki Kaisha. Process for manufacture of metallic magnesium. 4,437,886, Cl. 75-67.00R.
Miura, Kenichi, to Fujitsu Limited. Decoder and method utilizing partial and redundant decoding. 4,438,427, Cl. 340-347.0DD.
Miura, Yasuyuki: *See*—
Shiseki, Yutaka; Yagi, Junichi; and Miura, Yasuyuki, 4,438,358, Cl. 310-51.000.
Miwa, Naoto; and Nakajima, Hiroshi, to Mitsubishi Petrochemical Co., Ltd.; and Unitika Ltd. Measuring composition. 4,438,199, Cl. 435-190.000.
Miyahara, Michito: *See*—
Furukawa, Mitsuhiki; Miyahara, Michito; Kitahira, Takashi; Misumi, Kiyohito; Shiroyama, Masaharu; and Wada, Toshiaki, 4,438,213, Cl. 501-92.000.
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Miyamoto, Akira; Shimizu, Senzo; Harada, Masahiro; Ajiro, Tamotu; and Hara, Hideki, to Mitsubishi Gas Chemical Co., Ltd. Process for preparing polyamide with molten dicarboxylic acid component. 4,438,257, Cl. 528-347.000.
Miyamoto, Koichi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,437,757, Cl. 355-15.000.
Miyamoto, Yoshiaki, to Nippon Oil Seal Industry Co., Ltd. Sealing device. 4,437,673, Cl. 277-65.000.
Miyamoto, Yoshimi, to Nippondenso Company Limited. Connector for automotive ignition devices. 4,437,719, Cl. 339-91.00R.
Miyasaka, Kenji, to Citizen Watch Company Limited. Movement structure for an electronic timepiece. 4,437,768, Cl. 368-88.000.
Miyashita, Takao; Aizawa, Hidekuni; and Takamiya, Toru, to Sony Corporation. Tape cassette having means for adjusting a tape segment length for a thermal printer. 4,437,778, Cl. 400-208.000.
Miyatsuka, Hajime: *See*—
Umemura, Shizuo; Matsufuji, Akihiro; Aonuma, Masashi; Kitamoto, Tatsuji; and Miyatsuka, Hajime, 4,437,882, Cl. 75-0.50R.
Miyazaki, Yasunosuke: *See*—
Kubo, Kunimichi; Miyazaki, Yasunosuke; Yoshikawa, Mamoru; and Miyoshi, Mituji, 4,438,073, Cl. 422-135.000.
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Mizelle, Ned W., to Lane Company, The. Rocker-blocking device for rocking chair having projectable/rectractable footrest. 4,437,701, Cl. 297-85.000.
Mizukami, Hidekatu; and Machida, Yoshihiro, to Dainippon Screen Seizo Kabushiki Kaisha. Contact printer. 4,437,759, Cl. 355-91.000.
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Ueguri, Shigeo; Komura, Hirotsugu; and Mizuno, Takaji, 4,438,317, Cl. 219-130.510.
Mizusawa, Kiyoshi: *See*—
Nakajima, Motoo; and Mizusawa, Kiyoshi, 4,438,206, Cl. 436-130.000.
Mizutani, Yoshihisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming SOS devices by selective laser treatment and reactive formation of isolation regions. 4,437,225, Cl. 29-576.00B.
Mobil Oil Corporation: *See*—
Ashcraft, Charles R.; and Albertson, Kurt D., 4,438,175, Cl. 428-315.500.
Chester, Arthur W.; McVeigh, Harry A.; and Stover, William A., 4,437,978, Cl. 208-120.000.
Derbyshire, Francis J.; and Varghese, Philip, 4,437,972, Cl. 208-8.0LE.
Dessau, Ralph M.; and Kerr, George T., 4,438,215, Cl. 502-71.000.
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., 4,437,975, Cl. 208-87.000.
Holden, M. James, 4,438,054, Cl. 264-40.600.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,437,976, Cl. 208-97.000.
Richardson, Emmett M.; Chatas, Angelos T.; and Padilla, Joseph R., 4,437,521, Cl. 166-341.000.
Steiner, Robert H.; and Touhsaent, Robert E., 4,438,176, Cl. 428-349.000.
Tsui, Tien-Fung, 4,438,077, Cl. 423-7.000.
Moderlak, Helmut; Koschinek, Gunter; Zinsser, Rolf; Prehler, Richard; and Kretschmann, Bernd, to Davy McKee Aktiengesellschaft. Spinning manifold with serial nozzle blocks. 4,437,827, Cl. 425-378.00S.
Moelker, Huibert C. T.: *See*—
Sanders, Adrianus L. M.; Meuleman, Dirk G.; Moelker, Huibert C. T.; van Dedem, Gijsbert W. K.; and van Houdenhoven, Francois E. A., 4,438,108, Cl. 424-180.000.
Moenaert, Christian: *See*—
Sussmeyer, Robert; Pluvinage, Alain; and Moenaert, Christian, 4,437,940, Cl. 203-49.000.
Moffatt, Bruce S.: *See*—
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Molded Fiber Glass Companies: *See*—
Mollman, Robert E.; and Silva, Ralph, 4,438,059, Cl. 264-105.000.
Mollan, Raymond A. B., to National Research Development Corporation. Orthopedic diagnostic procedures and apparatus therefor. 4,437,473, Cl. 128-773.000.
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Momiyama, Kikuo, to Canon Kabushiki Kaisha. Inverted telephoto type wide angle objective of large relative aperture. 4,437,735, Cl. 350-458.000.

Monacelli, Walter J., to Plastics Engineering Company. Bis-(maleamic acid) derivatives of triamines. 4,438,280, Cl. 562-457.000.

Monarch Wine Co., Inc.: *See*—
Zaltsman, Efim, 4,437,291, Cl. 53-319.000.

Mondet, Jean: *See*—
Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,438,140, Cl. 424-61.000.

Monosov, Yakov A.: *See*—
Doev, Vitaly S.; Kotelyansky, Iosif M.; Kravchenko, Valery B.; Monosov, Yakov A.; Shakhunov, Valery A.; and Kopylov, Jury L., 4,438,443, Cl. 346-153.100.

Monsanto Company: *See*—
Garner, Albert Y., 4,438,034, Cl. 260-239.30R.
Howe, Robert K.; and Lee, Len F., 4,437,875, Cl. 71-90.000.
Howe, Robert K.; and Lee, Len F., 4,437,876, Cl. 71-90.000.

Montres Rado S.A.: *See*—
Gogniat, Paul, 4,437,770, Cl. 368-294.000.

Moore, Paul E.: *See*—
Rieppel, Perry J.; and Moore, Paul E., 4,437,649, Cl. 266-48.000.

Moorehead, James R., to Boeing Company, The. Integrated power plant installation system. 4,437,627, Cl. 244-54.000.

Moraw, Roland, to Hoechst Aktiengesellschaft. Fixing device for copier. 4,438,321, Cl. 219-216.000.

Mordau, Manfred: *See*—
Stolz, Albert; and Mordau, Manfred, 4,437,393, Cl. 98-2.170.

Mori, Kazuhiro: *See*—
Araki, Shigeru; Taki, Yasuo; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,437,232, Cl. 29-740.000.

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Mori, Toshihito: *See*—
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Mori, Toshio: *See*—
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Mori, Yutaka: *See*—
Nakamura, Keiichi; Haga, Kyosuke; and Mori, Yutaka, 4,437,532, Cl. 180-142.000.

Morishima, Masayuki: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,438,311, Cl. 219-10.49R.

Morison, Rodney, to Garrett Corporation, The. Piezoelectric actuator. 4,438,364, Cl. 310-328.000.

Morita, Jun: *See*—
Okuda, Kuniteru; and Morita, Jun, 4,437,493, Cl. 138-45.000.

Morita, Jyun-ichi: *See*—
Saito, Takao; Morita, Jyun-ichi; Hirose, Kikuji; and Kato, Akitosi, 4,437,947, Cl. 204-35.00R.

Morita, Katuhiro; and Kubota, Hitoshi, to Nissan Motor Company, Limited. Tandem master cylinder with a pressure regulating valve for an automotive vehicle brake system. 4,437,310, Cl. 60-562.000.

Morita, Yoshinori: *See*—
Kashiwa, Norio; Morita, Yoshinori; and Suga, Michiharu, 4,438,243, Cl. 526-125.000.

Moriya, Ryusuke; Eguchi, Takeo; and Ohba, Takeo, to Sony Corporation. Tracking control system for an information signal recording and reproducing apparatus. 4,438,465, Cl. 360-22.000.

Moriya, Shigeru; Yoshida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Tsuge, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seatbelt system. 4,437,683, Cl. 280-804.000.

Moriya, Shigeru; Yoshida, Akio; Matsunami, Muneharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seatbelt system. 4,437,684, Cl. 280-804.000.

Moriyoshi, Yusuke: *See*—
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Morohashi, Kazuo; Kajikawa, Teruo; and Iwai, Sakuya, to Nippon Oil Company Ltd. Method of making a carpet tile. 4,437,918, Cl. 156-322.000.

Moroi, Shiro: *See*—
Aramaki, Minoru; Kita, Yasushi; Nakano, Hishagi; and Moroi, Shiro, 4,438,086, Cl. 423-448.000.

Morrisroe, John P. Artificial seaweed. 4,437,786, Cl. 405-24.000.

Morse, Erwin E., to James River Corporation of Virginia. Cellulose granules and process for producing the same. 4,438,263, Cl. 536-56.000.

Morse, Milton, to APM Corporation. Protective cover for telephone push button array. 4,438,300, Cl. 179-184.000.

Morwing, Bo A., to Telefonaktiebolaget L M Ericsson. Device for sampling and holding the carrier frequency of short duration pulses. 4,438,392, Cl. 324-79.00R.

Mosier, Larry D., to Mallinckrodt, Inc. Radioimmunoassay for fibrinopeptide A. 4,438,209, Cl. 436-542.000.

Moskalik, Leonid M.; Ryadchikov, Vladimir E.; Bykov, Anatoly P.; Kulesh, Vladimir P.; Opasov, Stanislav I.; and Orlov, Anatoly A. Phase-metering device. 4,438,393, Cl. 324-83.00D.

Motorola, Inc.: *See*—
Lee, Robert D., 4,438,388, Cl. 323-313.000.
Murphy, Earl R., 4,438,436, Cl. 343-16.00M.
Ryan, Carl R., 4,438,413, Cl. 332-16.00R.
Selinko, George J., 4,437,718, Cl. 339-61.00M.
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Motta, Gianni: *See*—
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Motta, Raimondo: *See*—
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Moylan, John J. Mechanically programmable chess play indicator. 4,437,666, Cl. 273-141.00R.

MSS Associates: *See*—
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Muacevic, Gojko: *See*—
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Rapp, Guenther; Thomas, Erwin; and Muenster, Rolf, 4,438,084, Cl. 423-387.000.

Muhl, Hubertus: *See*—
Hittel, Gerhard; Muhl, Hubertus; Eigl, Franz; and Langer, Werner, 4,437,323, Cl. 66-84.00A.

Muilwijk, Dirk, to U.S. Philips Corporation. Receiver for angle-modulated carrier signals. 4,438,524, Cl. 375-80.000.

Mukaizaka, Akira: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,437,881, Cl. 75-0.5AA.

Muller, Bernard L.: *See*—
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Muller, Leo: *See*—
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Munscher, Wolfgang, to Siemens Aktiengesellschaft. Data display device. 4,438,458, Cl. 358-254.000.

Murakami, Naoyuki; and Zyo, Hiroshi, to Murakami, Naoyuki. Loudspeaker. 4,437,540, Cl. 181-147.000.

Murase, Ichiki; Fujita, Fumio; Ohnishi, Toshihiro; and Tamura, Toshifumi, to Sumitomo Chemical Company, Limited. Highly dielectric polysaccharides. 4,438,262, Cl. 536-43.000.

Murata, Masayoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,438,113, Cl. 424-246.000.

Murata, Yukio: *See*—
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Murphy, Earl R., to Motorola Inc. Millimeter wave monopulse comparator circuit. 4,438,436, Cl. 343-16.00M.

Muto, Katsuya: *See*—
Akita, Yoshio; Maruyama, Toshinori; and Muto, Katsuya, 4,438,384, Cl. 320-48.000.

Myers, James F.; and Thoemke, Lloyd C. Double secondary seal for floating roof tanks. 4,437,577, Cl. 220-224.000.

Myers, Paul A., to Raymark Industries, Inc. Fused metallic friction materials. 4,438,004, Cl. 252-12.000.

Naab, Paul: *See*—
Boberg, Michael; Habich, Dieter; Metzger, Karl G.; and Naab, Paul, 4,438,114, Cl. 424-248.510.

Nabata, Hiroyuki: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, 4,438,115, Cl. 424-250.000.

Naegele, Paul: *See*—
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Naftulin, Henry. Apparatus for collecting fluids. 4,437,472, Cl. 128-767.000.

Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. 2-(2-Fluoro-4-halo-5-substituted phenyl) hydantoins and use. 4,437,877, Cl. 71-90.000.

Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, to Chugai Seiyaku Kabushiki Kaisha. Compositions and methods for treating diseases in circulatory organs. 4,438,115, Cl. 424-250.000.

Nagaoka, Tateki: *See*—
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Nagasawa, Koichi: *See*—
Abe, Haruhiko; Harada, Hiroshi; Denda, Masahiko; Nagasawa, Koichi; and Kono, Yoshio, 4,438,368, Cl. 315-39.000.

Nagatsuka, Kenichi, to Mitsubishi Kakoki Kaisha Ltd.; Kakoki Engineering Service Co., Ltd.; and Genshi-Ryoku Daiko Co., Ltd. Automatic wall cleaning machine. 4,437,202, Cl. 15-320.000.

Naitoh, Hiromitsu: *See*—
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Nakae, Kiyohiko: *See*—
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Nakagawa, Masao; and Nishida, Tatehiko, to Kanegafuchi Chemical Industry Co., Ltd. Heat resistant expandable plastic particles and molded articles produced therefrom. 4,438,222, Cl. 521-60.000.
Nakagawa, Satoshi: *See*—
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Nakajima, Hiroshi: *See*—
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Nakajima, Motoo; and Mizusawa, Kiyoshi, to Kikkoman Corporation. Method for determination of formaldehyde. 4,438,206, Cl. 436-130.000.
Nakajima, Yoshinori, to Ricoh Co., Ltd. Input signal control device. 4,438,507, Cl. 364-900.000.
Nakamura, Keiichi; Haga, Kyosuke; and Mori, Yutaka, to Toyoda Koki Kabushiki Kaisha. Steering force controller for a power steering device. 4,437,532, Cl. 180-142.000.
Nakamura, Nobuo: *See*—
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Nakano, Hirofumi: *See*—
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Nakano, Hishagi: *See*—
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Nakano, Shozaburo: *See*—
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Nakano, Tadashi; Tamura, Hiroyuki; and Kubo, Naoki, to Sumitomo Metal Mining Company Limited. Method for manufacture of arsenious anhydride. 4,438,079, Cl. 423-87.000.
Nakashima, Shinobu: *See*—
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Nalewajek, David, to Allied Corporation. Recovery of gadolinium and gallium oxides. 4,438,078, Cl. 423-21.500.
Nall, James B.; and King, Jeffery J., to Brahams, Ronald Jay. Composition and method of masking. 4,438,227, Cl. 524-33.000.
Namekata, Kiyokazu: *See*—
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.
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Nardi, Dante; Tajana, Alberto; Motta, Gianni; Cazzulani, Pietro; and Graziani, Gabriele, to Recordati S.A. Therapeutically effective derivatives of cystine. 4,438,133, Cl. 424-300.000.
Narita, Ryuho; Yamamori, Kenji; Oota, Hiroyuki; and Aoshima, Terutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cooker. 4,438,324, Cl. 219-441.000.
Narozny, Ronald S., to Thomas & Betts Corporation. Three-row connector for mass terminating flat cable. 4,437,723, Cl. 339-99.00R.
Nathaniel, Elmer O.; and Eibert, John, Jr. Skating surface. 4,438,003, Cl. 252-12.000.
National Can Corporation: *See*—
Hinds, James J.; Hoeflich, John C.; and Kolodziej, George C., 4,437,985, Cl. 209-538.000.
National Institute for Researches in Inorganic Materials: *See*—
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Graham, Neil B., 4,438,258, Cl. 528-361.000.
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Mollan, Raymond A. B., 4,437,473, Cl. 128-773.000.
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Natsume, Toshio: *See*—
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Romano-Moran, Roberto, 4,438,157, Cl. 427-93.000.
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Neff, James A., to Mac Valves, Inc. Low-wattage solenoid. 4,438,418, Cl. 335-255.000.
Negosta, Edward. Mail box signal. 4,437,607, Cl. 232-35.000.
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Nelson, Jeffrey. Implement for measuring skin temperatures. 4,437,471, Cl. 128-736.000.
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Nelson, Philip E.; and Takada, Norihisa, to Purdue Research Foundation. Method for controlling consistency of tomato products. 4,437,934, Cl. 159-47.100.
Nelson, Wayne F., to A. Schulman, Inc. Modified ionomer blend and application thereof. 4,438,162, Cl. 427-318.000.
Neptune Water Meter Company: *See*—
Karjalainen, William G., 4,437,344, Cl. 73-197.000.
NesTier Corporation: *See*—
Davis, Walter G., 4,437,434, Cl. 119-45.00R.
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New Generation Foods, Inc.: *See*—
Colby, Ronald W.; and Spicer, Arnold, 4,438,146, Cl. 426-448.000.
Newman, Leon A.: *See*—
Chenausky, Peter P.; Newman, Leon A.; and Drinkwater, Erroll H., 4,438,514, Cl. 372-64.000.
Newman, Oliver M. G.; Palmer, David J.; and Pammenter, Robert V., to Electrolytic Zinc Company of Australasia Limited. Process for solution control in an electrolytic zinc plant circuit. 4,437,953, Cl. 204-119.000.
Newton, Charles L.; and Fuini, Dennis L., to Air Products and Chemicals, Inc. Recovery of power from vaporization of liquefied natural gas. 4,437,312, Cl. 60-648.000.
NGK Spark Plug Co., Ltd.: *See*—
Suzuki, Shin; and Sato, Toshihiko, 4,437,440, Cl. 123-145.00A.
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Nicholas Proprietary Limited: *See*—
Kaufman, Jeffrey L., 4,438,085, Cl. 423-419.00P.
Nicholson, Raymond; and Parker, Donald O. Coin detector apparatus. 4,437,558, Cl. 194-97.00R.
Nieh, Edward C. Y.; and Naylor, Carter G., to Texaco Inc. Amphoteric surfactants. 4,438,045, Cl. 260-501.130.
Nigmela, Tapio. Means for making a ski trail. 4,437,245, Cl. 37-222.000.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
Ohashi, Shigeo, 4,437,728, Cl. 350-96.200.
Nijhof, W. A. J., to U. S. Industries, Inc. Poultry broiler cage. 4,437,433, Cl. 119-18.000.
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Nippin Shokubai Kagako Kogyo Co., Ltd.: *See*—
Takata, Masahiro; Aoki, Ryuji; and Sato, Takahisa, 4,438,217, Cl. 502-205.000.
Nippon Electric Co., Ltd.: *See*—
Shoji, Masashi, 4,438,349, Cl. 307-362.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Matsumoto, Toyosaku, 4,438,510, Cl. 369-271.000.
Okumura, Takatoshi, 4,437,379, Cl. 84-1.220.
Nippon Gijutsu Boeki Co., Ltd.: *See*—
Yazawa, Nobuharu; and Sakaguchi, Yasunori, 4,438,405, Cl. 328-152.000.
Nippon Kogaku K.K.: *See*—
Fujiu, Takamitsu; Ogino, Makoto; Kariya, Michio; and Ichimura, Takeo, 4,437,192, Cl. 3-1.900.
Iizuka, Yutaka, 4,437,734, Cl. 350-454.000.
Ohno, Masato; and Ohsawa, Keiji, 4,437,747, Cl. 354-126.000.
Takahashi, Tomowaki; Konno, Kunio; and Sasaya, Toshihiro, 4,437,733, Cl. 350-427.000.
Terui, Nobuhiko; and Magariyama, Kenichi, 4,437,744, Cl. 354-442.000.
Nippon Oil Company, Ltd.: *See*—
Kubo, Kunimichi; Miyazaki, Yasunosuke; Yoshikawa, Mamoru; and Miyoshi, Mituji, 4,438,073, Cl. 422-135.000.
Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, 4,437,883, Cl. 75-0.50C.
Morohashi, Kazuo; Kajikawa, Teruo; and Iwai, Sakuya, 4,437,918, Cl. 156-322.000.
Nippon Oil and Fats, Co., Ltd.: *See*—
Araki, Masatada; and Tanaka, Yukio, 4,437,800, Cl. 407-119.000.
Nippon Oil Seal Industry Co., Ltd.: *See*—
Miyamoto, Yoshiaki, 4,437,673, Cl. 277-65.000.
Nippon Soken, Inc.: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,437,345, Cl. 73-204.000.
Iwamoto, Kenzi; and Omata, Katsuhiro, 4,437,311, Cl. 60-602.000.
Nippon Steel Corporation: *See*—
Furukawa, Takashi; and Endo, Michio, 4,437,903, Cl. 148-12.00F.
Mori, Kensuke; Matsumoto, Hiromi; Suga, Yozo; Nakayama, Tadashi; and Matsumoto, Fumio, 4,437,909, Cl. 148-111.000.
Nitto, Hajime; and Naitoh, Hiromitsu, 4,437,905, Cl. 148-16.000.

Nozawa, Tadao; Yamamoto, Takaaki; Nakayama, Tadashi; Matsumoto, Fumio; and Hayami, Satohiro, 4,437,910, Cl. 148-112.000.
Ozawa, Masaichi, 4,437,620, Cl. 242-83.000.
Saito, Takao; Morita, Jyun-ichi; Hirose, Kikuji; and Kato, Akitosi, 4,437,947, Cl. 204-35.00R.
Sato, Takashi; and Ozawa, Tsutomu, 4,437,907, Cl. 148-31.550.

Nippon Tungsten Co., Ltd.: *See*—
Furukawa, Mitsuhiki; Miyahara, Michito; Kitahira, Takashi; Misumi, Kiyohito; Shiroyama, Masaharu; and Wada, Toshiaki, 4,438,213, Cl. 501-92.000.

Nippondenso Co., Ltd.: *See*—
Akita, Yoshio; Maruyama, Toshinori; and Muto, Katsuya, 4,438,384, Cl. 320-48.000.
Eguchi, Osamu; and Fukui, Tomonori, 4,437,391, Cl. 98-2.010.
Isomura, Shigenori; Kobayashi, Akio; Kato, Katsushi; Kowada, Ichiro; and Nishii, Sachio, 4,437,446, Cl. 123-492.000.
Ito, Shinzo; Kato, Tateshi; Noma, Takumi; Sugimoto, Soichiro; and Toiyama, Seigi, 4,437,341, Cl. 73-119.00A.
Miyamoto, Yoshimi, 4,437,719, Cl. 339-91.00R.
Nojiri, Tadao; Kanemaru, Kenji; Nishikawa, Takayoshi; Matsuyama, Masahiro; and Ito, Yoji, 4,438,422, Cl. 340-52.00F.
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.
Tsuchida, Takashi; Kondo, Nobuo; Okada, Kazukiyo; and Okuda, Yutaka, 4,438,425, Cl. 340-55.000.
Yasui, Toshio, 4,438,424, Cl. 340-52.00H.

Nir, Aharon; Amiel, Abraham J.; and Krant, Jonathan M., to Yeda Research & Development Co. Ltd. System for heat storage particularly for using in agriculture. 4,437,263, Cl. 47-1.00R.

Nishida, Tatehiko: *See*—
Nakagawa, Masao; and Nishida, Tatehiko, 4,438,222, Cl. 521-60.000.

Nishii, Sachio: *See*—
Isomura, Shigenori; Kobayashi, Akio; Kato, Katsushi; Kowada, Ichiro; and Nishii, Sachio, 4,437,446, Cl. 123-492.000.

Nishikawa, Takayoshi: *See*—
Nojiri, Tadao; Kanemaru, Kenji; Nishikawa, Takayoshi; Matsuyama, Masahiro; and Ito, Yoji, 4,438,422, Cl. 340-52.00F.

Nishikori, Tsutomu; and Yoshiki, Yasuo, to Toyo Kogyo Co., Ltd.; and Delta Kogyo Co., Ltd. Seat back reclining mechanism. 4,437,703, Cl. 297-362.000.

Nishimoto, Shigeru: *See*—
Gaino, Mitsunori; Iijima, Ikuo; Nishimoto, Shigeru; Ikeda, Kuichiro; and Fujii, Tokuo, 4,438,035, Cl. 260-239.30B.

Nishimura, Masaaki: *See*—
Shibata, Takashi; and Nishimura, Masaaki, 4,438,525, Cl. 381-63.000.

Nishimura, Yoshichika: *See*—
Ishizuka, Tetsuo; Hotta, Hiroshi; and Nishimura, Yoshichika, 4,437,861, Cl. 44-1.00R.

Nishimura, Yuji: *See*—
Moriya, Shigeru; Yoshida, Akio; Matsunami, Muneharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, 4,437,684, Cl. 280-804.000.

Nishiyama, Noboru: *See*—
Tateishi, Junji; Ishikawa, Takeharu; Nakano, Shozaburo; and Nishiyama, Noboru, 4,437,906, Cl. 148-26.000.

Nissan Motor Co., Ltd.: *See*—
Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, 4,437,342, Cl. 73-119.00A.
Kakimoto, Toshihiko, 4,437,653, Cl. 267-140.100.
Morita, Katuhiro; and Kubota, Hitoshi, 4,437,310, Cl. 60-562.000.
Nozawa, Koji, 4,437,550, Cl. 192-324.000.
Yamaguchi, Hiroshi, 4,437,442, Cl. 123-417.000.
Yasuhara, Seishi, 4,437,444, Cl. 123-458.000.

Nitschke, John S.: *See*—
McMaster, Harold A.; Nitschke, Norman C.; and Nitschke, John S., 4,437,871, Cl. 65-104.000.
McMaster, Harold A.; Nitschke, Norman C.; and Nitschke, John S., 4,437,872, Cl. 65-104.000.

Nitschke, Norman C.: *See*—
McMaster, Harold A.; Nitschke, Norman C.; and Nitschke, John S., 4,437,871, Cl. 65-104.000.
McMaster, Harold A.; Nitschke, Norman C.; and Nitschke, John S., 4,437,872, Cl. 65-104.000.

Nitto, Hajime; and Naitoh, Hiromitsu, to Nippon Steel Corporation. Process for continuously annealing a cold-rolled low carbon steel strip. 4,437,905, Cl. 148-16.000.

Nogita, Shunsuke: *See*—
Saito, Yukio; Nogita, Shunsuke; Watanabe, Syoji; and Baba, Kenji, 4,437,992, Cl. 210-603.000.

Nojiri, Tadao; Kanemaru, Kenji; Nishikawa, Takayoshi; Matsuyama, Masahiro; and Ito, Yoji, to Nippondenso Co., Ltd. Warning method and system for vehicles. 4,438,422, Cl. 340-52.00F.

Noma, Takumi: *See*—
Ito, Shinzo; Kato, Tateshi; Noma, Takumi; Sugimoto, Soichiro; and Toiyama, Seigi, 4,437,341, Cl. 73-119.00A.

Nomadic Structures, Inc.: *See*—
Zeigler, Theodore R., 4,437,275, Cl. 52-109.000.

Nomoto, Reishi; Akimoto, Masahiro; and Takahashi, Masayoshi, to Janome Sewing Machine Co., Ltd. Medical treatment sewing machine. 4,437,465, Cl. 128-340.000.

Nomura, Isshi; and Akagi, Motonobu, to Aisin Seiki Kabushiki Kaisha. Electrically driven flow control valve assembly. 4,437,645, Cl. 251-65.000.

Nordco Limited: *See*—
Fancey, Everett G.; Peters, John V.; and Tucker, Russell E., 4,437,254, Cl. 43-4.000.

Nordin, Ivan C.: *See*—
Schweiss, Dietrich; and Nordin, Ivan C., 4,438,092, Cl. 424-273.00P.

Nordmeyer, Robert A.: *See*—
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.

Nordson Corporation: *See*—
Coker, William R., 4,437,581, Cl. 222-54.000.
Sprague, Clyde D., 4,437,594, Cl. 222-544.000.

Norris, Robert D.: *See*—
McEuen, Bruce K.; and Norris, Robert D., 4,438,080, Cl. 423-112.000.

North American Philips Electric Corp.: *See*—
Hicks, John M.; and Engel, Joseph C., 4,438,369, Cl. 315-49.000.

Nothnagel, Joseph L., to Freeman Chemical Corporation. Continuous stream mixer having variable dwell time chamber with auger. 4,438,072, Cl. 422-133.000.

Nozawa, Koji, to Nissan Motor Company, Limited. Industrial vehicle driving apparatus. 4,437,550, Cl. 192-324.000.

Nozawa, Tadao; Yamamoto, Takaaki; Nakayama, Tadashi; Matsumoto, Fumio; and Hayami, Satohiro, to Nippon Steel Corporation. Process for producing grain-oriented electromagnetic steel sheet. 4,437,910, Cl. 148-112.000.

Nozue, Shigehiro; Fukuoka, Tatsuhiko; and Sugiura, Hideaki, to Taiho Kogyo Co., Ltd. Thrust bearing with tapered lands. 4,437,215, Cl. 29-149.50R.

Nuodex Inc.: *See*—
Petronella, Joseph, 4,438,038, Cl. 260-414.000.

Nutter, Norman E., to General Electric Company. Turning gear interlock. 4,437,809, Cl. 415-41.000.

Nyffeler, Corti AG: *See*—
Buri, Hermann; and Karth, Beat, 4,437,292, Cl. 53-357.000.

Oak Industries Inc.: *See*—
Van Zeeland, Anthony J., 4,438,301, Cl. 200-16.00C.

Obayashi, Hideki: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,437,345, Cl. 73-204.000.

Ober, John W.; and Ferry, John M., to Omnitronics Research Corporation. Multiple function personal security alarm. 4,438,428, Cl. 340-521.000.

Obitz, Daniel, to Synthelabo. Isoquinoline amidoxime derivatives. 4,438,121, Cl. 424-258.000.

Obland, Donald R. Drug dispensing apparatus and removal tool. 4,437,579, Cl. 221-25.000.

O'Brian, Edward D.; and Phelan, Charles, to O'Brian, Edward D. Folding structure employing a Sarrus linkage. 4,437,413, Cl. 108-111.000.

O'Brien, Michael B. Insulation support hanger. 4,437,282, Cl. 52-407.000.

Occidental Oil Shale, Inc.: *See*—
Cha, Chang Y.; and McCarthy, Harry E., 4,437,519, Cl. 166-259.000.

Ochiai, Kuniaki; Horii, Masami; and Ishii, Hidekazu, to Tokyo Electric Co., Ltd. Dot printer head. 4,437,775, Cl. 400-124.000.

O'Connor, Rodney J., to Romec Enviroamental Research & Development, Inc. Dribble ring. 4,437,583, Cl. 222-108.000.

Oda, Shinichiro: *See*—
Kamei, Hideaki; Yamanaka, Kazuhiko; Fujisawa, Haruhiko; and Oda, Shinichiro, 4,438,468, Cl. 360-92.000.

Odaka, Kentaro, to Sony Corporation. Method for editing of PCM signal and apparatus thereof. 4,438,464, Cl. 360-13.000.

Oeder, Dieter; Ziegler, Walter; Daeuble, Manfred; Dietsche, Wolfram; Hettche, Albert; and Weiss, Stefan, to BASF Aktiengesellschaft. Lubricant, containing esterified ethylene/acrylic acid or ethylene/-maleic acid copolymers as the active ingredient, for moulding chlorine-containing thermoplastics. 4,438,008, Cl. 252-56.00R.

Officine Meccaniche Savi Antonio S.p.A.: *See*—
Savi, Antonio, 4,437,398, Cl. 99-587.000.

Ogawa, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Shaft seal for pump means. 4,437,821, Cl. 418-104.000.

Ogawa, Tadatoshi: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Ogawa, Tadatoshi; Kotani, Kozo; and Hosono, Hidekazu, 4,438,238, Cl. 525-240.000.

Ogino, Makoto: *See*—
Fujiu, Takamitsu; Ogino, Makoto; Kariya, Michio; and Ichimura, Takeo, 4,437,192, Cl. 3-1.900.

Ogita, Koichi, to Yokota Co., Ltd. Curtain drawer arrangement. 4,437,506, Cl. 160-331.000.

Oh, Indong. Protrusio cup. 4,437,193, Cl. 3-1.912.

O'Hanlon, Tom A.; Madonna, Peter L.; and Wallace, Gearld F., to Flow Industries, Inc. Hand held water drilling apparatus. 4,437,525, Cl. 175-218.000.

Ohashi, Shigeo, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Photoswitch. 4,437,728, Cl. 350-96.200.

Ohba, Takeo; and Koga, Hirohisa, to Sony Corporation. Deflectable transducer mounting assembly. 4,438,469, Cl. 360-109.000.

Ohba, Takeo: *See*—
Moriya, Ryusuke; Eguchi, Takeo; and Ohba, Takeo, 4,438,465, Cl. 360-22.000.

Ohie, Tomonori, to Diesel Kiki Co., Ltd. Electronic fuel injection feedback control method for internal combustion engines. 4,438,496, Cl. 364-431.050.

Ohloff, Gunther: *See*—
Skorianetz, Werner; and Ohloff, Gunther, 4,438,023, Cl. 252-522.00R.
Ohlsson, Ingemar; and Wolf, Sten J. L. Ear-cap. 4,437,538, Cl. 181-129.000.
Ohmura, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Thin sheet sorting apparatus. 4,437,571, Cl. 209-551.000.
Ohnishi, Toshihiro: *See*—
Murase, Ichiki; Fujita, Fumio; Ohnishi, Toshihiro; and Tamura, Toshifumi, 4,438,262, Cl. 536-43.000.
Ohno, Masato; and Ohsawa, Keiji, to Nippon Kogaku K.K. Device for mounting an electronic flash unit. 4,437,747, Cl. 354-126.000.
Ohsawa, Keiji: *See*—
Ohno, Masato; and Ohsawa, Keiji, 4,437,747, Cl. 354-126.000.
Ohta, Ryuji, to Jidosha Kiki Co., Ltd. Power-servo booster. 4,437,390, Cl. 92-84.000.
Ohta, Takayuki; Yanaga, Yukio; and Hino, Seiichi, to Mitsubishi Chemical Industries, Limited. Copolyamide acid and copolyimide. 4,438,256, Cl. 528-188.000.
Ohtsuki, Osamu: *See*—
Chibata, Ichiro; Sumi, Akihiko; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,438,044, Cl. 260-501.120.
Okada, Kazukiyo: *See*—
Tsuchida, Takashi; Kondo, Nobuo; Okada, Kazukiyo; and Okuda, Yutaka, 4,438,425, Cl. 340-55.000.
Okada, Yoshio; Terauchi, Takashi; Naoki, Makoto; and Hino, Masatoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Catalyst for dehydrocoupling of toluene or xylene. 4,438,021, Cl. 502-341.000.
Okamura Corporation: *See*—
Suzuki, Hideo, 4,438,318, Cl. 219-137.0PS.
Okamura, Shozo: *See*—
Minami, Ryohei; Okamura, Shozo; Sunami, Yoshihiko; Hosoi, Takuji; and Kanou, Takuo, 4,437,974, Cl. 208-10.000.
Okinaka, Yutaka; Smith, Craig G.; and Smith, Lawrence E., to Bell Telephone Laboratories, Incorporated. Copper plating procedure. 4,437,948, Cl. 204-52.00R.
Okubo, Shuji: *See*—
Tomita, Fusao; Matsuda, Yuzuru; Shirahata, Kunikatsu; Takahashi, Keiichi; Nakano, Hirofumi; Sato, Tomoyasu; Okubo, Shuji; and Nakamura, Nobuo, 4,438,197, Cl. 435-119.000.
Okuda, Kuniteru; and Morita, Jun. Constant flow control valve. 4,437,493, Cl. 138-45.000.
Okuda, Yoshiro: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,437,881, Cl. 75-0.5AA.
Okuda, Yutaka: *See*—
Tsuchida, Takashi; Kondo, Nobuo; Okada, Kazukiyo; and Okuda, Yutaka, 4,438,425, Cl. 340-55.000.
Okugawa, Michihide, to Dainichi-Nippon Cables, Ltd. Process for treating cyanic liquid containing copper(I) cyanide complex ion. 4,437,996, Cl. 210-718.000.
Okumura, Hiroshi: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,438,311, Cl. 219-10.49R.
Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of waveform memory readout type. 4,437,379, Cl. 84-1.220.
Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Two-stage hydrocarbon dewaxing hydrotreating process. 4,437,976, Cl. 208-97.000.
Olin Corporation: *See*—
Beck, Alexander F.; and Winter, Joseph, 4,437,943, Cl. 204-16.000.
Grynkewich, Gregory W., 4,438,013, Cl. 252-146.000.
Pryor, Michael J.; and Tyler, Derek E., 4,437,508, Cl. 164-418.000.
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Horling, Peter; Hetterich, Hermann; and Kunkel, Heinrich, to SKF Kugellagerfabriken GmbH. Non-machining method of manufacturing a solid-bottomed or internally flanged bearing race. 4,437,214, Cl. 29-149.5DP.
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, to SKF Kugellagerfabriken GmbH. Method of making a thin-walled bearing bushing. 4,437,330, Cl. 72-358.000.
Olson, Floyd V. Particle spreader apparatus. 4,437,613, Cl. 239-688.000.
Olson, George E., to A. O. Smith Harvestore Products, Inc. Overload mechanism for the system of a bottom silo unloader. 4,437,806, Cl. 414-307.000.
Olson, Raymond E., to Profold, Inc. Bottom sheet feed system. 4,437,658, Cl. 271-125.000.
Olympus Optical Co., Ltd.: *See*—
Ikari, Kazuo, 4,437,750, Cl. 354-155.000.
Sato, Eiichi; Shimizu, Akira; and Yanagisawa, Kazuhisa, 4,438,186, Cl. 430-53.000.
Omae, Michinobu; and Hirano, Takashi, to Yamato Scale Company, Ltd. Combination weighing machine. 4,437,527, Cl. 177-25.000.
Omata, Katsuhiro: *See*—
Iwamoto, Kenzi; and Omata, Katsuhiro, 4,437,311, Cl. 60-602.000.
Omnetics, Inc.: *See*—
Lambert, Roger T., 4,437,726, Cl. 339-252.00P.
Omnitronics Research Corporation: *See*—
Ober, John W.; and Ferry, John M., 4,438,428, Cl. 340-521.000.
Omori, Hiroshi: *See*—
Anahara, Meiji; and Omori, Hiroshi, 4,437,302, Cl. 57-333.000.
Omron Tateisi Electronics Company: *See*—
Uchida, Yasuo, 4,438,326, Cl. 235-379.000.
Ono, Hironobu: *See*—
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.
Ono, Masayuki, to Kabushiki Kaisha Tomoku. Process of manufacturing of reinforced corrugated cardboard type packaging container. 4,437,850, Cl. 493-89.000.
Onoda, Shigeyoshi; and Nagaoka, Tateki, to Canon Kabushiki Kaisha. Sheet feeding device. 4,437,656, Cl. 271-10.000.
Oota, Hiroyuki: *See*—
Narita, Ryuho; Yamamori, Kenji; Oota, Hiroyuki; and Aoshima, Terutaka, 4,438,324, Cl. 219-441.000.
Ooue, Michio: *See*—
Sudo, Ryoichi; Shoji, Fusaji; Watanabe, Takeshi; Suzuki, Kenkichi; and Ooue, Michio, 4,437,731, Cl. 350-340.000.
Opasov, Stanislav I.: *See*—
Moskalik, Leonid M.; Ryadchikov, Vladimir E.; Bykov, Anatoly P.; Kulesh, Vladimir P.; Opasov, Stanislav I.; and Orlov, Anatoly A., 4,438,393, Cl. 324-83.00D.
Opelika Manufacturing Corporation: *See*—
Brocklehurst, Charles E.; and Cooper, Bruce H., 4,437,369, Cl. 83-18.000.
Oppeniaender, Knut; Strickler, Rainer; Seib, Karl; and Naegele, Paul, to BASF Aktiengesellschaft. Cosmetic formulations containing oxyethylated diphenylamines as sun screen agents. 4,438,094, Cl. 424-59.000.
Oppermann, Wilhelm: *See*—
Balser, Klaus; Tuebner, Helwig; and Oppermann, Wilhelm, 4,438,264, Cl. 536-91.000.
Optical Radiation Corp.: *See*—
Hahs, Gregory L., 4,437,194, Cl. 3-13.000.
Oriol, Marcel. Installation for monitoring an endless cloth conveyor belt. 4,437,563, Cl. 198-810.000.
Orlov, Anatoly A.: *See*—
Moskalik, Leonid M.; Ryadchikov, Vladimir E.; Bykov, Anatoly P.; Kulesh, Vladimir P.; Opasov, Stanislav I.; and Orlov, Anatoly A., 4,438,393, Cl. 324-83.00D.
Orn, John F.: *See*—
McGrann, Harold J.; Orn, John F.; and Pallaver, Matthew C., 4,437,351, Cl. 73-862.050.
Orndorff, Roy L., Jr.: *See*—
Kramer, James H.; Orndorff, Roy L., Jr.; and Stephens, James M., 4,437,688, Cl. 285-95.000.
Orne, Laurence E. Variable gain amplifier. 4,438,410, Cl. 330-278.000.
O'Rourke, Joseph D.; and Katcher, Jay H., to General Foods Corporation. Process for making an improved dry instant pudding mix. 4,438,148, Cl. 426-579.000.
Osaka, Toshiaki: *See*—
Mitomo, Mamoru; Moriyoshi, Yusuke; Sakai, Toshikazu; and Osaka, Toshiaki, 4,438,051, Cl. 264-1.200.
Oshiage, Katsunori: *See*—
Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, 4,437,342, Cl. 73-119.00A.
Oshiki, Mitsumasa; and Kawakami, Susumu, to Fujitsu Limited. Magnetic head for perpendicular magnetic recording system. 4,438,471, Cl. 360-125.000.
Oswald, Joseph A., Jr., to Du Pont de Nemours, E. I., and Company. Solder bonding process. 4,437,236, Cl. 29-879.000.
Ota, Hiroshi: *See*—
Yokoyama, Masao; Kon, Masaharu; and Ota, Hiroshi, 4,437,682, Cl. 280-764.100.
Ota, Seiiti: *See*—
Satsuki, Teruhisa; Ota, Seiiti; and Tabata, Setsuko, 4,438,025, Cl. 252-545.000.
Otawa, Shuji: *See*—
Shida, Masaharu; Ueda, Makoto; Otawa, Shuji; Mandai, Masaaki; and Sato, Katsuhiko, 4,437,769, Cl. 368-204.000.
Otis Engineering Corporation: *See*—
Canalizo, Carlos R., 4,437,514, Cl. 166-53.000.
Otto, Gerhard: *See*—
Bredow, Walter; and Otto, Gerhard, 4,437,224, Cl. 29-568.000.
Outboard Marine Corporation: *See*—
Billingsley, Henry C., 4,437,448, Cl. 123-577.000.
Owens-Corning Fiberglas Corporation: *See*—
Gaul, David J.; Hinze, Jay W.; and Perkins, Richard A., 4,438,518, Cl. 373-39.000.
Yeager, Raymond W.; and Weitzman, Mark R., 4,437,542, Cl. 181-290.000.
Oxon Italia S.p.A.: *See*—
Stabile, Nicolo; Motta, Raimondo; and Gosso, Giancarlo, 4,438,276, Cl. 560-13.000.
Ozaki, Nobuo; and Hosokawa, Mikio, to Maeda Industries, Ltd. Double lever assembly for bicycle speed control. 4,437,357, Cl. 74-475.000.
Ozawa, Masaichi, to Nippon Steel Corporation. Method and apparatus for gathering rings or wire rods into coils. 4,437,620, Cl. 242-83.000.
Ozawa, Shigeru: *See*—
Hayasaka, Tadao; Suzuki, Masahiro; Ozawa, Shigeru; and Takeya, Yoshiaki, 4,437,890, Cl. 75-244.000.
Ozawa, Tsutomu: *See*—
Sato, Takashi; and Ozawa, Tsutomu, 4,437,907, Cl. 148-31.550.
Ozen Co., Ltd.: *See*—
Shiseki, Yutaka; Yagi, Junichi; and Miura, Yasuyuki, 4,438,358, Cl. 310-51.000.
Pace Incorporated: *See*—
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Reschly, David C., to Detroit Stoker Company. Rotary continuous ash discharge stoker. 4,437,452, Cl. 126-182.000.
Research Corporation: *See—*
Erickson, Bruce W.; and Hugli, Tony E., 4,438,029, Cl. 260-112.50R.
Research Foundation for Microbial Diseases of Osaka University, The: *See—*
Shimada, Kazuo; Akiyama, Masataka; and Sudo, Masami, 4,438,093, Cl. 424-50.000.
Resnick, Paul R.: *See—*
Bissot, Thomas C.; Grot, Walter G.; and Resnick, Paul R., 4,437,951, Cl. 204-98.000.
Reuter, Herbert: *See—*
Kuhling, Dieter; Huppertzl Josef; Krings, Peter; and Reuter, Herbert, 4,438,012, Cl. 252-131.000.
Rex, Robert W., to Republic Geothermal, Inc. Treatment of geothermal brine sulfate-rich fluids to facilitate the precipitation of silica. 4,437,995, Cl. 210-714.000.
Reynolds, Graeme E. Clamp for hydraulic hose bundles. 4,437,791, Cl. 405-195.000.
Rheude, Alfred: *See—*
Pfeifer, Josef; and Rheude, Alfred, 4,438,164, Cl. 428-35.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Desbois, Michel, 4,438,043, Cl. 260-465.00F.
Jacques, Roland; Reppelin, Michel; and Seigneurin, Laurent, 4,438,042, Cl. 260-465.00B.
Jecker, Gilbert, 4,437,888, Cl. 75-84.400.
Riblet, Leslie A.: *See—*
Allen, Lloyd E.; and Riblet, Leslie A., 4,438,119, Cl. 424-251.000.
Rica, Albert F.; Hay, Lloyd F.; Heron, John R.; Webber, John R.; and Rechtsteiner, Steven A., to FranRica Mfg. Inc. Flexible bag cooling arrangement. 4,437,315, Cl. 62-63.000.
Richardson, Emmett M.; Chatas, Angelos T.; and Padilla, Joseph R., to Mobil Oil Corporation. Subsea wellhead connection assembly and methods of installation. 4,437,521, Cl. 166-341.000.
Richter, Simon J.; and Aykanian, Ardashus A., to Coca-Cola Company, The. Tube inserting machine. 4,438,061, Cl. 264-249.000.
Ricoh Co. Ltd.: *See—*
Abe, Takeshi, 4,437,336, Cl. 73-40.50R.
Jinnai, Koichiro; and Ebi, Yutaka, 4,438,440, Cl. 346-75.000.
Komada, Kenya; and Tan, Yui-Kuan, 4,438,444, Cl. 346-155.000.
Nakajima, Yoshinori, 4,438,507, Cl. 364-900.000.
Riebli, Peter: *See—*
Hubele, Adolf; Eckhardt, Wolfgang; and Riebli, Peter, 4,438,125, Cl. 424-269.000.
Rieck, Hans-Peter, to Hoechst Aktiengesellschaft. Process for the purification of cyclic chlorophosphazenes. 4,438,081, Cl. 423-300.000.
Rieck, Richard E.: *See—*
Hartung, Michael H.; Rieck, Richard E.; and Tayler, Gerald E., 4,438,512, Cl. 371-60.000.
Riecke, Wolfgang D., to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Corpuscular radiation device for producing an irradiation pattern on a workpiece. 4,438,336, Cl. 250-398.000.
Rieppel, Perry J.; and Moore, Paul E., to Arcair Company. Exothermic cutting electrode. 4,437,649, Cl. 266-48.000.
Righetti, Gaetano, to Hoyne Industries, Inc. Beveling apparatus. 4,437,268, Cl. 51-327.000.
Riker Laboratories, Inc.: *See—*
Barnett, William E., 4,438,261, Cl. 536-21.000.
Rinderle, Heinz: *See—*
Malinowski, Christopher W.; and Rinderle, Heinz, 4,438,412, Cl. 331-2.000.
Rittler, Hermann L., to Corning Glass Works. Transparent colorless glass-ceramics especially suitable for use as stove windows. 4,438,210, Cl. 501-4.000.
RIV-SKF Officine: *See—*
Colanzi, Franco; and Donn, Vittorio, 4,437,536, Cl. 180-254.000.
Roach, Bobbie R. Tree ornament container. 4,437,713, Cl. 312-259.000.
Robert Bosch GmbH: *See—*
Babitzka, Rudolf; and Linder, Ernst, 4,438,363, Cl. 310-328.000.
Csanitz, Herbert; and Weyl, Helmut, 4,437,971, Cl. 204-427.000.
Drews, Ulrich; Rapps, Peter; and Werner, Peter, 4,437,339, Cl. 73-118.000.
Leiber, Heinz; and Stegmeier, Alwin, 4,438,420, Cl. 335-275.000.
Ragaly, Istvan, 4,437,846, Cl. 464-36.000.
Stumpe, Werner, 4,437,504, Cl. 152-427.000.
Roberts, Roy D., to Texaco Inc. Environmentally safe process for disposing of toxic inorganic CN-containing sludge. 4,437,417, Cl. 110-346.000.
Robertson, James C.: *See—*
Stoller, David A., Jr.; Robertson, James C.; and Matyas, Tibor, 4,437,410, Cl. 105-378.000.
Robertson, John A.: *See—*
Cullen, Donald L.; and Robertson, John A., 4,438,402, Cl. 324-452.000.
Rock, Merlin A., to International Harvester Co. Automatic header height control. 4,437,295, Cl. 56-10.200.
Rockwell International Corporation: *See—*
Heredy, Laszlo A.; and Skowronski, Raymund P., 4,437,980, Cl. 208-235.000.
Soclof, Sidney I., 4,437,226, Cl. 29-577.00R.
Rockwood, Stephen D.; and Sander, Robert K., to United States of America, Energy. Device and method for separating oxygen isotopes. 4,437,958, Cl. 204-157.10R.
Rodberg, Kenneth: *See—*
Butler, John L.; Egan, Thomas R.; Rodberg, Kenneth; and Clark, Arthur E., 4,438,509, Cl. 367-156.000.
Rodgers, Patricia. Drapery closure. 4,437,505, Cl. 160-126.000.
Rodov, Vladimir: *See—*
Harrington, Alan L.; Allison, Richard; and Rodov, Vladimir, 4,438,448, Cl. 357-23.000.
Roesch, Egon: *See—*
Ross, Carl H.; Kampe, Wolfgang; Bartsch, Wolfgang; Sponer, Gisbert; and Roesch, Egon, 4,438,116, Cl. 424-250.000.
Rog, Joseph W.; Waits, Charles G.; and Nicholas, Karl W., to Harco Corporation. Electrical survey apparatus and method with spinner-type conductor supply. 4,438,391, Cl. 324-71.100.
Rohatin, Frederick. Turn-on control system for voltage drop compensators. 4,438,387, Cl. 323-260.000.
Roine, Martin W., to Boeing Company, The. Seat structure having an adjustable seat back and support shelf especially for accommodating parachute packs. 4,437,629, Cl. 244-122.00R.
Rokop Corporation: *See—*
Rokop, Joseph; and Rokop, Nikolaus, 4,437,899, Cl. 148-9.00R.
Rokop, Joseph; and Rokop, Nikolaus, to Rokop Corporation. Metal billet cutting apparatus and method. 4,437,899, Cl. 148-9.00R.
Rokop, Nikolaus: *See—*
Rokop, Joseph; and Rokop, Nikolaus, 4,437,899, Cl. 148-9.00R.
Rollot, Pierre: *See—*
Cordier, Jean; and Rollot, Pierre, 4,437,651, Cl. 266-193.000.
Rolls-Royce Limited: *See—*
Cantwell, Hugh F., 4,437,303, Cl. 60-39.281.
McCormick, Michael A.; and Gladdish, Peter, 4,438,406, Cl. 328-167.000.
Pearce, Eric W. J., 4,437,810, Cl. 415-115.000.

Romagnoli, Andrea, to I.M.A.-Industria Macchine Automatiche-S.p.A. Volumetric batching device for providing predetermined batches of a fluent material. 4,437,294, Cl. 53-553.000.

Roman, Daniel J.: *See*—
Bitler, Joel R.; Bodnar, Michael W.; Booth, Raymond H.; Roman, Daniel J.; Schneider, Fred J.; Seitzer, Philip W.; and Wilkinson, George F., Jr., 4,437,229, Cl. 29-593.000.

Romano-Moran, Roberto, to NCR Corporation. Process for forming MNOS dual dielectric structure. 4,438,157, Cl. 427-93.000.

Romec Environmental Research & Development, Inc.: *See*—
O'Connor, Rodney J., 4,437,583, Cl. 222-108.000.

Rose, John B.: *See*—
Cogswell, Frederic N.; Griffin, Brian P.; and Rose, John B., 4,438,236, Cl. 525-165.000.

Rosenberg, Irwin, to Aero-Motive Mfg. Co. Positioning reel. 4,437,624, Cl. 242-107.300.

Rosenquist, Niles R.; and Lee, Garland G., to General Electric Company. Compositions comprising a thermoplastic resin and a vinyl ether mold release agent. 4,438,234, Cl. 524-378.000.

Rosenquist, Niles R., to General Electric Company. Acyloxy terminated copolyester-carbonates. 4,438,255, Cl. 528-176.000.

Rosenthal, Manfred: *See*—
Weber, Wendelin; and Rosenthal, Manfred, 4,437,780, Cl. 400-642.000.

Rosenthal, Paul: *See*—
Castiglioni, Joseph; and Rosenthal, Paul, 4,437,513, Cl. 165-154.000.

Ross, Carl H.; Kampe, Wolfgang; Bartsch, Wolfgang; Sponer, Gisbert; and Roesch, Egon, to Boehringer Mannheim GmbH. Quinoxalinyloxy-amino-propanol compounds with blood pressure lowering and β-blocking properties, their use and pharmaceutical compositions containing them. 4,438,116, Cl. 424-250.000.

Ross, Henry M. Magnetic, force-limited apparatus for tenderizing meat. 4,437,207, Cl. 17-25.000.

Rossy, Phillip A.: *See*—
Acker, Rolf-Dieter; Rossy, Phillip A.; Hamprecht, Gerhard; and Wuerzer, Bruno, 4,437,878, Cl. 71-90.000.

Rost, Jan: *See*—
Meltsch, Hans J.; and Rost, Jan, 4,438,294, Cl. 174-88.00R.

Rotron, Incorporated: *See*—
Brown, Fred A., 4,438,362, Cl. 310-152.000.

Routh, Donald E.; and Sharma, Gian C., to United States of America, National Aeronautics and Space Administration. Method for sequentially processing a multi-level interconnect circuit in a vacuum chamber. 4,437,961, Cl. 204-192.0EC.

Royer, Neal B., to Emerson Electric Co. Dynamoelectric machine structure and method. 4,438,359, Cl. 310-68.00R.

Rubin, Harvey, to Bell Telephone Laboratories, Incorporated. System for accessing and testing subscriber loops. 4,438,298, Cl. 179-175.20R.

Rubin, Michael D.; and Ho, Pang T., to Ford Aerospace & Communications Corporation. Temperature compensating method and apparatus for thermally stabilizing amplifier devices. 4,438,411, Cl. 330-289.000.

Ruhrchemi AG: *See*—
Gorris, Rainer; Hibbel, Josef; Gerhardus, Ulrich; and Scheve, Heinrich, 4,437,864, Cl. 48-62.00R.

Ruhrkohle AG: *See*—
Gorris, Rainer; Hibbel, Josef; Gerhardus, Ulrich; and Scheve, Heinrich, 4,437,864, Cl. 48-62.00R.

Ruklic, William. Tamper-resistant bottle cap. 4,437,574, Cl. 215-247.000.

Rush-Presbyterian-St. Luke's Medical Center: *See*—
Djordjevich, Ljubomir; and Sadove, Max S., 4,437,469, Cl. 128-672.000.

Russ, Stephen; and McAnespie, Don, to Midland-Ross Corporation. Flotation nozzle. 4,437,612, Cl. 239-556.000.

Rust, Bernd-Hendrik: *See*—
Bierkarre, Hartwig; Klinger, Gottfried; Radeloff, Jurgen; and Rust, Bernd-Hendrik, 4,437,533, Cl. 180-168.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidation of aromatic compounds to quinones by use of sodium hypochlorite. 4,438,037, Cl. 260-385.000.

Ryadchikov, Vladimir E.: *See*—
Moskalik, Leonid M.; Ryadchikov, Vladimir E.; Bykov, Anatoly P.; Kulesh, Vladimir P.; Opasov, Stanislav I.; and Orlov, Anatoly A., 4,438,393, Cl. 324-83.00D.

Ryan, Carl R., to Motorola Inc. Serial minimum shift keyed modulator including notch and bandpass filters. 4,438,413, Cl. 332-16.00R.

S. C. Johnson & Son, Inc.: *See*—
Benicek, Jeanne A.; and Schrader, Rodney W., 4,438,009, Cl. 252-90.000.

S.I.A.C.O. Limited: *See*—
Shaw, George, 4,437,269, Cl. 51-358.000.

S.I.S.A.S. Societa Italina Serie Acetica Sintetica S.p.A.: *See*—
Codignola, Franco, 4,438,285, Cl. 568-861.000.

Sabre Safety Limited: *See*—
Glynn, Michael H., 4,437,460, Cl. 128-204.260.

Sadove, Max S.: *See*—
Djordjevich, Ljubomir; and Sadove, Max S., 4,437,469, Cl. 128-672.000.

Safonnikov, Anatoly N.; and Antonov, Anatoly V., to Institut Elektrosvarki Imeni E.O. Patona; and Akademii Nauk Ukrainsko. Electroslag welding method. 4,438,313, Cl. 219-73.100.

St. John, Michael R.: *See*—
Sammells, Anthony F.; and St. John, Michael R., 4,437,954, Cl. 204-129.000.

Saint-Leger, Didier J.; and Abrioux, Andre, to "L'Oreal". Process for sampling and analysis by thin layer chromatography. 4,438,205, Cl. 436-71.000.

Saito, Masaki: *See*—
Ishikawa, Reiji; Saito, Masaki; Mori, Toshio; and Tamura, Hidemasa, 4,438,160, Cl. 427-214.000.

Saito, Syuichiro: *See*—
Akashi, Akira; Katsuma, Makoto; Kawamura, Masaharu; Kamata, Shigeru; and Saito, Syuichiro, 4,437,752, Cl. 354-289.000.

Saito, Takao; Morita, Jyun-ichi; Hirose, Kikuji; and Kato, Akitosi, to Nippon Steel Corporation. Cold rolled steel strip having an excellent phosphatizing property and process for producing the same. 4,437,947, Cl. 204-35.00R.

Saito, Yukio; Nogita, Shunsuke; Watanabe, Syoji; and Baba, Kenji, to Hitachi, Ltd. Process for controlling an aeration tank in an activated sludge sewage treatment. 4,437,992, Cl. 210-603.000.

Saizi, Mituhiro: *See*—
Yanagiuchi, Shigenobu; and Saizi, Mituhiro, 4,438,505, Cl. 364-900.000.

Sakaguchi, Yasunori: *See*—
Yazawa, Nobuharu; and Sakaguchi, Yasunori, 4,438,405, Cl. 328-152.000.

Sakai, Kazushige: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, 4,438,115, Cl. 424-250.000.

Sakai, Masaaki; and Yoshihiro, Mitsugu, to Sony Corporation. Stop control circuit for brushless DC motor. 4,438,377, Cl. 318-254.000.

Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Signal processing system. 4,437,743, Cl. 354-402.000.

Sakai, Toshikazu: *See*—
Mitomo, Mamoru; Moriyoshi, Yusuke; Sakai, Toshikazu; and Osaka, Toshiaki, 4,438,051, Cl. 264-1.200.

Sakakima, Hiroshi; Satomi, Mitsuo; Senno, Harufumi; and Hirota, Eiichi, to Matsushita Electric Industrial Co., Ltd. Amorphous magnetic alloys. 4,437,912, Cl. 148-403.000.

Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,437,757, Cl. 355-15.000.

Sakamoto, Hitoshi, to Sony Corporation. Tracking control system. 4,438,463, Cl. 360-10.200.

Sakano, Hajime: *See*—
Fujimori, Yoshitugu; Takabori, Yasuo; Sakano, Hajime; and Ito, Akitoshi, 4,438,229, Cl. 524-109.000.

Sakumoto, Akinori, to Daiwa Seiko Inc. Handle folding device for fishing reel. 4,437,621, Cl. 242-84.10J.

Sakurayama, Junichi; and Magome, Tamotsu, to Canon Kabushiki Kaisha. Liquid handling apparatus for an electrostatic copier. 4,437,755, Cl. 355-10.000.

Salenbo, Sten A. Method and apparatus for handling and setting up large size slit-boxes. 4,437,851, Cl. 493-124.000.

Saletore, Vikram: *See*—
Haque, Yusuf A.; Saletore, Vikram; and Schuler, Jeffrey A., 4,438,354, Cl. 307-493.000.

Saltzer, Jerome H., to Massachusetts Institute of Technology. System for regenerating a data word on a communications ring. 4,438,520, Cl. 375-4.000.

Sammells, Anthony F.; and St. John, Michael R., to Institute of Gas Technology. Fuels production by photoelectrolysis of water and photooxidation of soluble biomass materials. 4,437,954, Cl. 204-129.000.

Sampson, Jacob. Meat tenderizer. 4,437,208, Cl. 17-26.000.

Samulski, Thaddeus V. Luminescent decay time techniques for temperature measurement. 4,437,772, Cl. 374-129.000.

Sanborn, Philip A., Jr., to W. R. Grace & Co., Cryovac Div. Method and apparatus for making a reclosable package. 4,437,293, Cl. 53-412.000.

Sanchez, Victor; Espenan, Patrick; Casademont, Ernest; and Lafaille, J. Pierre, to Centre National de la Recherche Scientifique. Apparatus for electrophoretically fractionating a solution. 4,437,967, Cl. 204-301.000.

Sanden Corporation: *See*—
Terauchi, Kiyoshi; and Hiraga, Masaharu, 4,437,820, Cl. 418-55.000.

Sander, Robert K.: *See*—
Rockwood, Stephen D.; and Sander, Robert K., 4,437,958, Cl. 204-157.10R.

Sanders, Adrianus L. M.; Meuleman, Dirk G.; Moelker, Huibert C. T.; van Dedem, Gijsbert W. K.; and van Houdenhoven, Francois E. A., to Akzo N.V. Anti-thromboticum based on polysaccharides, and pharmaceutical compositions. 4,438,108, Cl. 424-183.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,437,200, Cl. 15-306.00A.
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,437,324, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for continuous dehydration. 4,437,200, Cl. 15-306.00A.

Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, to Sando Iron Works Co., Ltd. Apparatus for treating a cloth continuously with the use of low-temperature plasma. 4,437,324, Cl. 68-5.00E.

Sandoz Ltd.: *See*—
Bauer, Wilfried; Cardinaux, Francois; Huguenin, Rene; Pless, Janos; and Sandrin, Edmond, 4,438,103, Cl. 424-177.000.
Sandrin, Edmond: *See*—
Bauer, Wilfried; Cardinaux, Francois; Huguenin, Rene; Pless, Janos; and Sandrin, Edmond, 4,438,103, Cl. 424-177.000.
Sanko, John R., to Paris Manufacturing Company, Inc. Pressing and creasing apparatus. 4,437,246, Cl. 38-25.000.
Sankyo Company Limited: *See*—
Hiraoka, Tetsuo; and Kobayashi, Takeo, 4,438,265, Cl. 544-29.000.
Terahara, Akira; Hamano, Kiyoshi; Tsujita, Yoshio; and Tanaka, Minoru, 4,438,277, Cl. 560-119.000.
Sano, Jun; Aoyama, Masahide; and Kubo, Daijiro, to Tokyo Shibaura Denki Kabushiki Kaisha. I^2L Circuit with a variable injector current source. 4,438,353, Cl. 307-477.000.
Sanraku-Ocean Co., Ltd.: *See*—
Kubo, Katsuro; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,438,201, Cl. 435-228.000.
Sanyo Electric Co., Ltd.: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,438,311, Cl. 219-10.49R.
Sarangapani, Srinivasan: *See*—
Kampe, Dennis J.; and Sarangapani, Srinivasan, 4,438,216, Cl. 502-101.000.
Sarli, Michael S.: *See*—
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., 4,437,975, Cl. 208-87.000.
Sasaki, Hideaki: *See*—
Kobayashi, Mamoru; Ishige, Kanji; Sasaki, Hideaki; Tani, Mitsukiyo; and Kawakami, Yashuhiko, 4,437,603, Cl. 228-4.500.
Sasaki, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic imaging apparatus. 4,437,348, Cl. 73-625.000.
Sasaya, Toshihiro: *See*—
Takahashi, Tomowaki; Konno, Kunio; and Sasaya, Toshihiro, 4,437,733, Cl. 350-427.000.
Sato, Eiichi; Shimizu, Akira; and Yanagisawa, Kazuhisa, to Olympus Optical Company Limited. Electrophotographic process and photosensitive screen for use in such process. 4,438,186, Cl. 430-53.000.
Sato, Hiroyasu; Yamamoto, Kazuaki; and Aotsu, Hiroaki, to Hitachi, Ltd. Automatic voltage regulation system for AC generator. 4,438,385, Cl. 322-28.000.
Sato, Katsuhiko: *See*—
Shida, Masaharu; Ueda, Makoto; Otawa, Shuji; Mandai, Masaaki; and Sato, Katsuhiko, 4,437,769, Cl. 368-204.000.
Sato, Kunio: *See*—
Mitarai, Tsuyoshi; and Sato, Kunio, 4,437,377, Cl. 84-1.010.
Sato, Takahisa: *See*—
Takata, Masahiro; Aoki, Ryuji; and Sato, Takahisa, 4,438,217, Cl. 502-205.000.
Sato, Takashi; and Ozawa, Tsutomu, to Nippon Steel Corporation. Amorphous alloy for use as a core. 4,437,907, Cl. 148-31.550.
Sato, Takeshi, to Matsushita Electric Industrial Co., Ltd. TV Tuner circuit. 4,438,529, Cl. 455-190.000.
Sato, Tomoyasu: *See*—
Tomita, Futao; Matsuda, Yuzuru; Shirahata, Kunikatsu; Takahashi, Keiichi; Nakano, Hirofumi; Sato, Tomoyasu; Okubo, Shuji; and Nakamura, Nobuo, 4,438,197, Cl. 435-119.000.
Sato, Toshihiko: *See*—
Suzuki, Shin; and Sato, Toshihiko, 4,437,440, Cl. 123-145.00A.
Sato, Yasuhisa, to Canon Kabushiki Kaisha. Light measuring device for a single lens reflex camera. 4,437,741, Cl. 354-479.000.
Satoh, Susumu: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, 4,438,126, Cl. 424-272.000.
Satomi, Mitsuo: *See*—
Sakakima, Hiroshi; Satomi, Mitsuo; Senno, Harufumi; and Hirota, Eiichi, 4,437,912, Cl. 148-403.000.
Satomura, Masato, to Fuji Photo Film Co., Ltd. Polymers containing aromatic sulfonic acid ester or amide groups. 4,438,245, Cl. 526-286.000.
Satou, Hiroshi: *See*—
Miura, Hirohisa; Satou, Hiroshi; and Natsume, Toshio, 4,437,886, Cl. 75-67.00R.
Satsuki, Teruhisa; Ota, Seiiti; and Tabata, Setsuko, to Lion Corporation. Detergent compositions. 4,438,025, Cl. 252-545.000.
Saulson, Stanley H.; Schroeppel, Edward A.; and Tarjan, Peter P., to Cordis Corporation. Cardiac pacer with improved battery system, output circuitry, and emergency operation. 4,437,466, Cl. 128-419.0PS.
Saurer-Diederichs (Societe Anonyme): *See*—
Deborde, Albert H.; and Volland, Michel F., 4,437,352, Cl. 73-862.470.
Savi, Antonio, to Officine Meccaniche Savi Antonio S.p.A. Rotating-drum machine for peeling tomatoes. 4,437,398, Cl. 99-587.000.
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Goto, Hirokazu; and Abiko, Shuzo, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magnetic head of magnetic reluctance effect type and a method for making the same. 4,438,470, Cl. 360-113.000.
Schaefer, Donald W.: *See*—
Caron, Christopher D.; and Schaefer, Donald W., 4,437,659, Cl. 271-276.000.
Schafer, Wolfgang: *See*—
Zaschke, Horst; Schafer, Wolfgang; Deutscher, Hans-Joachim; Demus, Dietrich; and Pelzl, Gerhard, 4,438,268, Cl. 544-315.000.
Schairbaum, Albert W.: *See*—
Slocum, Donald H.; Schairbaum, Albert W.; and Curtis, William M., 4,437,274, Cl. 52-105.000.
Schaller, Karl H.; and Zimmermann, Volker, to International Business Machines Corporation. Magnetic disk track following servo burst amplitude drop compensation. 4,438,467, Cl. 360-77.000.
Schalungsverleih Heinzle AG: *See*—
Heinzle, Otto, 4,437,640, Cl. 249-20.000.
Scheer, Erich: *See*—
Tomm, Dagwin; and Scheer, Erich, 4,437,555, Cl. 192-70.210.
Scheibenpflug, Konrad, to Siemens Aktiengesellschaft. Arrangement for fastening a monitor to a text station. 4,437,638, Cl. 248-282.000.
Schenck, Timothy T., to Du Pont de Nemours, E. I., and Company. Filled and plasticized blends of linear low density polyethylene. 4,438,228, Cl. 524-109.000.
Scheve, Heinrich: *See*—
Gorris, Rainer; Hibbel, Josef; Gerhardus, Ulrich; and Scheve, Heinrich, 4,437,864, Cl. 48-62.00R.
Schievelbein, Vernon H.; and Zabczuk, Paul, to Texaco Inc. Surfactant flooding solution. 4,438,002, Cl. 252-8.55D.
Schiffarth, Josef: *See*—
Dunkelmann, Dietger; Jaunich, Helmut; and Schiffarth, Josef, 4,438,515, Cl. 373-88.000.
Schilbe, Rick: *See*—
Demers, Robert J.; and Schilbe, Rick, 4,437,490, Cl. 137-512.400.
Schiller, Norman H.; and Alfano, Robert R., to Hamamatsu Corporation. Picosecond delay device. 4,438,416, Cl. 333-160.000.
Schipper, Dennis J., to ACF Industries, Inc. Valve for discharge outlet and actuating means therefore. 4,437,798, Cl. 406-119.000.
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Schleimann-Jensen, C. Arne, to TII Industries, Inc. Method for manufacturing a gas-filled discharge tube for use as transient protection. 4,437,845, Cl. 445-39.000.
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Gruber, Peter; Schmid, Jochen; Lechner, Horst; and Bauer, Eckhart, 4,438,091, Cl. 424-21.000.
Schmidt, Manfred: *See*—
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Schmittmann, Hans-Bernd; and Thier, Alfons, to Wiersma, Charles M.; and Wiersma, Jack G., by said Alfons Thier. Fire retardant and compounds based thereon. 4,438,028, Cl. 252-609.000.
Schmitz-Josten, Robert; Suling, Carlhans; Podszun, Wolfgang; Bomer, Bruno; Borgardt, Manfred; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Photopolymerizable dental compositions. 4,437,836, Cl. 433-199.000.
Schnabl, Karl; Hoppner, Eberhard; and Kastl, Hans, to Kraftwerk Union Aktiengesellschaft. Eddy current testing device for metal tubes or pipes having a quick release coupling with a bayonet lock. 4,438,399, Cl. 324-220.000.
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Dirlikov, Stoil K.; and Schneider, Connie J., 4,438,226, Cl. 521-175.000.
Schneider, Fred J.: *See*—
Bitler, Joel R.; Bodnar, Michael W.; Booth, Raymond H.; Roman, Daniel J.; Schneider, Fred J.; Seitzer, Philip W.; and Wilkinson, George F., Jr., 4,437,229, Cl. 29-593.000.
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Schnettler, Shirley I.; and Gilloon, Elinor. Educational aid and method of using same. 4,437,837, Cl. 434-178.000.
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Schuermeyer, Fritz L. Gallium arsenide MIS integrated circuits. 4,438,351, Cl. 307-450.000.
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Schultz, Daryl A. Drilling bit bearings. 4,437,774, Cl. 384-92.000.
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Schwartz, Jeremy; and Frick, Raymond, to Ingersoll-Rand Company. Radial sealing means for use with, and in combination with, a slotted rotor. 4,437,822, Cl. 418-122.000.
Schwartz, Lionel H.; Miller, Scott W.; and Severud, Christopher N., Jr., to Falcon Safety Products, Inc. Self-contained anti-static adapter for compressed gas dust blowing devices. 4,438,479, Cl. 361-213.000.
Schwartz, Marcus, to United States of America, Navy. Position and restraint system for aircrewman. 4,437,628, Cl. 244-122.0AG.
Schwarz, Eckhard C. A., to Biax Fiberfilm Corporation. Novel porous fabric. 4,438,167, Cl. 428-138.000.
Schwarz, Hans D.: *See*—
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Schwarz, Herbert F., to Polysar Limited. Carboxylated nitrile rubber/PVC/nylon flux blends. 4,438,230, Cl. 524-151.000.
Schweiss, Dietrich; and Nordin, Ivan C., to Warner-Lambert Company. 5-Amino-N-(3-chloro- 2-methyl-, or 2-fluorophenyl)-1,3-dimethyl-1H-pyrazole-4-carboxamides and use as an anti-convulsant. 4,438,092, Cl. 424-273.00P.
Schweitzer, Edmund O., Jr. Fault indicator with combined trip and reset winding. 4,438,403, Cl. 324-133.000.
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Seeger, Hans-Peter, to Ystral GmbH. Dispersion turbine. 4,437,765, Cl. 366-264.000.
Seeley, Robert J. Molding machine. 4,437,507, Cl. 164-173.000.
Seib, Karl: *See*—
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Shida, Masaharu; Ueda, Makoto; Otawa, Shuji; Mandai, Masaaki; and Sato, Katsuhiko, 4,437,769, Cl. 368-204.000.
Seitz, Hans; Rach, Heinz-Dieter; Pieper, Henner; and Frerichs, Udo, to Continental Gummi-Werke Aktiengesellschaft. Tread configuration for pneumatic vehicle tires. 4,437,503, Cl. 152-209.00R.
Seitz, Werner: *See*—
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.
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Sekel, Stephen M.; Strange, Rodney G.; and Verrinder, Robert F., to Tektronix, Inc. Power supply output monitoring method and apparatus. 4,438,498, Cl. 364-483.000.
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Selinko, George J., to Motorola Inc. Non-hermetically sealed stackable chip carrier package. 4,437,718, Cl. 339-61.00M.
Sells, Mary A.; and Scott, John W., to Sprague Electric Company. Process for anodizing aluminum foil. 4,437,945, Cl. 204-35.00N.
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Settineri, William J.; and Hensler, John M., to Dow Chemical Company, The. Retardation of polymer buildup in monovinyl aromatic suspension polymerization using sulfur trioxide as reactor coating. 4,438,242, Cl. 526-62.000.
Severud, Christopher N., Jr.: *See*—
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Seybold, Guenther: *See*—
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Shanley, Robert L., II, to RCA Corporation. Adjustable coring circuit permitting coring extinction. 4,438,454, Cl. 358-31.000.
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Sharma, Gian C.: *See*—
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Kuranishi, Masaaki; and Togo, Yasuhiko, 4,438,328, Cl. 235-181.000.
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Shaw, George, to S.I.A.C.O. Limited. Abrasive and polishing sheets. 4,437,269, Cl. 51-358.000.
Shay, Joseph J., to Ethyl Products Company. Accumulative pressure pump. 4,437,588, Cl. 222-321.000.
Shell Oil Company: *See*—
Graiff, L. B.; and Laity, John L., 4,437,436, Cl. 123-1.00A.
Sheng, Tan T.; Sinha, Ashok K.; and Vaidya, Sheila, to Bell Telephone Laboratories, Incorporated. Solid state device with conductors having chain-shaped grain structure. 4,438,450, Cl. 357-68.000.
Shepter, Joseph J., to Scientific Circuitry, Inc. Logic circuit building block and systems constructed from same. 4,438,350, Cl. 307-440.000.
Sheridan, John P. Solar energy absorption and distribution system with full solar, solar assist, and fireplace heat exchanger modes. 4,437,511, Cl. 165-485.000.
Shibata, Takashi; and Nishimura, Masaaki, to Sony Corporation. Reverberation apparatus. 4,438,525, Cl. 381-63.000.
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Iwata, Minoru; Murata, Yukio; and Shibata, Tomoyuki, 4,437,811, Cl. 417-8.000.
Shibayama, Shigeki; and Iwata, Kazuhide, to Tokyo Shibaura Denki Kabushiki Kaisha. Data processing system with a slave computer using data registers as the sole operand store. 4,438,488, Cl. 364-200.000.
Shida, Masaharu; Ueda, Makoto; Otawa, Shuji; Mandai, Masaaki; and Sato, Katsuhiko, to Seiko Instruments & Electronics Ltd. Electronic timepiece. 4,437,769, Cl. 368-204.000.
Shimada, Kazuo; Akiyama, Masataka; and Sudo, Masami, to Research Foundation for Microbial Diseases of Osaka University, The. Oral composition containing dextranase and α-1,3 glucanase and a method for preventing and suppressing oral diseases using the same. 4,438,093, Cl. 424-50.000.
Shimano Industrial Company Limited: *See*—
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Shimano, Keizo, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,437,848, Cl. 474-82.000.
Shimatani, Michiro; and Kazama, Toyoki, to Fuji Electric Company, Ltd. Method for producing photosensitive film for electrophotography. 4,438,188, Cl. 430-128.000.
Shimizu, Akira: *See*—
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Shinoda, Nobuhiko: *See—*
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Shirley, Martin W., to National Research Development Corporation. Coccidiosis vaccines. 4,438,097, Cl. 424-88.000.

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Shiseki, Yutaka; Yagi, Junichi; and Miura, Yasuyuki, to Ozen Co., Ltd. Means for suppressing vibration and noise in a device driven by a small electric motor. 4,438,358, Cl. 310-51.000.

Shoji, Fusaji: *See—*
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Shoji, Masashi, to Nippon Electric Co., Ltd. Hysteresis circuit having a stable output free from noise superposed on input signal. 4,438,349, Cl. 307-362.000.

Shook, William B., to Thurston, Inc. Assembly for mounting a water bottle cage on a cycle frame. 4,437,596, Cl. 224-39.000.

Shreve, James S., to United States of America, Army. Self-survey means. 4,438,439, Cl. 343-449.000.

Shuey, John R.: *See—*
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Sibbald, Alastair: *See—*
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Sielaff GmbH & Co.: *See—*
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Sielfeld, Gilbert; and Sunder-Plassmann, Paul, to Chemische Werke Huels, AG. Process for the production of polymers and copolymers of vinyl chloride. 4,438,244, Cl. 526-202.000.

Siemens Aktiengesellschaft: *See—*
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Lippmann, Hans-Joachim; Peche, Gerhard; and Bettge, Hans, 4,438,307, Cl. 200-144.00B.
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Sigl, Wayne C.; and Frick, Richard H., to Kimberly-Clark Corporation. Disposable diaper with elasticized leg openings. 4,437,860, Cl. 604-385.000.

Sigma Instruments, Inc.: *See—*
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Simon, Lillian D. Card game. 4,437,670, Cl. 273-296.000.

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Simpson, Danny E.; Williams, David M.; Chase, Richard A.; and Grubb, Lawrence B., to Johnson & Johnson Baby Products Company. Puzzle post toy. 4,437,668, Cl. 273-156.000.

Singer Company, The: *See—*
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Siplast Siegerlander GmbH: *See—*
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Sjoerdsma, Albert, to Merrell Dow Pharmaceuticals Inc. Method of inhibiting algae. 4,437,873, Cl. 71-67.000.

SKF Kugellagerfabriken GmbH: *See—*
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Skorianetz, Werner; and Ohloff, Gunther, to Firmenich SA. Oxygenated tricyclic derivatives of norbornane and use of same as perfuming ingredients. 4,438,023, Cl. 252-522.00R.

Skowronski, Raymund P.: *See—*
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Slavetskas, Deborah. Hemi-sling. 4,437,459, Cl. 128-94.000.

Slocomb, Leon F., Jr.: *See—*
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Slocum, Donald H.; Schairbaum, Albert W.; and Curtis, William M., to Masonite Corporation. Building panel. 4,437,274, Cl. 52-105.000.

Smith, Craig G.: *See—*
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Smith, Daniel J.: *See—*
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Smith, Fred J., to Digital Products Corporation. Multimessage automatic telephone polling methods and apparatus. 4,438,296, Cl. 179-6.020.

Smith, Jay, III: *See—*
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Smith, Kenneth W.: *See—*
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Smith Kline & French Laboratories Limited: *See—*
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Smith, Lawrence E.: *See—*
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Smith and Nephew Associated Companies Limited: *See—*
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Smith, Robert B. Variable air volume building ventilation system. 4,437,608, Cl. 236-13.000.

Smith, Robert E., to Burr-Brown Research Corporation. Bar code reading system and method. 4,438,327, Cl. 235-462.000.

Smith, Robert L., to Merck & Co., Inc. Ophthalmic compositions of carbonic anhydrase inhibitors for topical application in the treatment of elevated intraocular pressure. 4,438,123, Cl. 424-270.000.

Smith, Roger A.; and Withers, Michael S., to Du Pont de Nemours, E. I., and Company. Coextruded multilayer cation exchange membranes. 4,437,952, Cl. 204-98.000.

Smith, Todd I.: *See—*
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SmithKline Beckman Corporation: *See—*
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Smiths Industries Public Limited Company: *See—*
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Smoot, George W.; and Macnak, Philip P., to Motorola, Inc. Multiaddress pager with a call storage and priority paging option. 4,438,433, Cl. 340-825.440.

Smulders, Auguste: *See—*
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Sniegoski, Paul J.: *See—*
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Snipes, Wallace: *See—*
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Snowden, Roger L.: *See—*
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Snyder, Carl E., Jr.; and Tamborski, Christ, to United States of America, Air Force. Perfluorinated aliphatic polyalkylether lubricant with an additive composed of an aromatic phosphine substituted with perfluoroalkylether groups. 4,438,006, Cl. 252-49.900.

Snyder, Carl E., Jr.; and Tamborski, Christ, to United States of America, Air Force. Perfluorinated aliphatic polyalkylether lubricant with an additive composed of an aromatic phosphine substituted with perfluoroalkylether groups. 4,438,007, Cl. 252-49.900.

Snyder, Daniel R.: *See—*
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Societe Anonyme Automobiles Citroen: *See—*
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Societe Anonyme Automobiles Peugeot: *See—*
Dore, Jacques, 4,437,219, Cl. 29-283.000.

Societe Anonyme dite: Alsthom-Atlantique: *See—*
Valibouse, Bernard, 4,437,989, Cl. 210-242.300.

Societe Anonyme dite: L'Oreal: *See—*
Grollier, Jean-Francois; and Allec, Josiane, 4,438,095, Cl. 424-70.000.
Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,438,140, Cl. 424-61.000.

Koulbanis, Constantin; N'Guyen, Quang L.; Zabotto, Arlette; and Plot, Josiane, 4,437,895, Cl. 106-245.000.
Societe Anonyme Engrenages et Reducteurs: *See*—
Durand, Francois; and Smulders, Auguste, 4,437,792, Cl. 405-198.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Hedrick, Paul L., Jr., 4,438,147, Cl. 426-570.000.
Societe J. Brochier & Fils: *See*—
Bompard, Bruno; and Bruyere, Alain, 4,437,221, Cl. 29-429.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, S.N.E.C.M.A.: *See*—
Halin, Yves R.; and Hersen, Rene M. J., 4,437,783, Cl. 403-27.000.
Menioux, Claude C. F., 4,437,441, Cl. 123-213.000.
Societe Vetrotex Saint-Gobain: *See*—
Lecron, Jacques; Manera, Maxime; Faure, Jean-Paul; and Renaudin, Jean-Pierre, 4,437,869, Cl. 65-1.000.
Soclof, Sidney I., to Rockwell International Corporation. Process for producing NPN type lateral transistor with minimal substrate operation interference. 4,437,226, Cl. 29-577.00R.
Solc, Jitka, to Dow Chemical Company, The. Resin particles with magnetic particles bonded to surface. 4,438,179, Cl. 428-407.000.
Sony Corporation: *See*—
Ishikawa, Reiji; Saito, Masaki; Mori, Toshio; and Tamura, Hidemasa, 4,438,160, Cl. 427-214.000.
Katsumata, Yasushi, 4,438,409, Cl. 330-107.000.
Maruo, Tsunehiro; and Inagaki, Masaomi, 4,438,398, Cl. 324-173.000.
Miyashita, Takao; Aizawa, Hidekuni; and Takamiya, Toru, 4,437,778, Cl. 400-208.000.
Moriya, Ryusuke; Eguchi, Takeo; and Ohba, Takeo, 4,438,465, Cl. 360-22.000.
Odaka, Kentaro, 4,438,464, Cl. 360-13.000.
Ohba, Takeo; and Koga, Hirohisa, 4,438,469, Cl. 360-109.000.
Sakai, Masaaki; and Yoshihiro, Mitsugu, 4,438,377, Cl. 318-254.000.
Sakamoto, Hitoshi, 4,438,463, Cl. 360-10.200.
Shibata, Takashi; and Nishimura, Masaaki, 4,438,525, Cl. 381-63.000.
Yoshinaka, Tadaaki, 4,438,456, Cl. 358-148.000.
Soong, Tsai C. String load apportioned racket. 4,437,662, Cl. 273-73.00D.
Soper, Douglas C.; and Gould, Brian, to British Gas Corporation. Mains insertion. 4,437,494, Cl. 138-97.000.
Sor, Inc.: *See*—
Johnson, James R., 4,438,305, Cl. 200-83.00J.
Soref, Richard A.: *See*—
Kroger, Harry; and Soref, Richard A., 4,437,761, Cl. 356-44.000.
Sorenson, John F., to Champion International Corporation. Shipping carton with case knife protection for inner cartons. 4,437,569, Cl. 206-601.000.
Sorenson, John F., to Champion International Corporation. Shipping carton with case knife protection for inner cartons. 4,437,570, Cl. 206-601.000.
Sorenson, Paul D.; and Dickson, Dale A., to Medtronic, Inc. Ultrasound scanning system with semi-independent transducer array. 4,437,468, Cl. 128-660.000.
Southgate, Robert: *See*—
Corbett, David F.; Southgate, Robert; and Coulton, Steven, 4,438,036, Cl. 260-245.20T.
Southwire Company: *See*—
Gentry, Bobby C., 4,437,901, Cl. 148-11.50A.
MacCraven, Joseph, 4,437,904, Cl. 148-13.100.
Spacesaver Corporation: *See*—
Dahnert, Dean L., 4,437,711, Cl. 312-201.000.
Speaker, Richard L. Spaghetti and food cooker. 4,437,395, Cl. 99-355.000.
Speil, Walter, to INA Walzlager Schaeffler KG. Valve tappet. 4,437,439, Cl. 123-90.560.
Spencer, Mike R.: *See*—
Lewis, Mack A.; and Spencer, Mike R., 4,437,699, Cl. 296-181.000.
Sperry Corporation: *See*—
Flannery, William E.; Josephs, Richard M.; Stein, Barry F.; Wang, Tsing-Chow; and Young, Peter L., 4,437,227, Cl. 29-589.000.
Kroger, Harry; and Soref, Richard A., 4,437,761, Cl. 356-44.000.
McGrann, Harold J.; Orn, John F.; and Pallaver, Matthew C., 4,437,351, Cl. 73-862.050.
Spicer, Arnold: *See*—
Colby, Ronald W.; and Spicer, Arnold, 4,438,146, Cl. 426-448.000.
Spielman, Lyle S., to Eclipse, Inc. Burner block assembly for industrial furnaces. 4,437,415, Cl. 110-182.500.
Spitz, Melvin P., to Kinematic Industries, Inc. Folding sofa-bed mechanism. 4,437,197, Cl. 5-13.000.
Sponer, Gisbert: *See*—
Ross, Carl H.; Kampe, Wolfgang; Bartsch, Wolfgang; Sponer, Gisbert; and Roesch, Egon, 4,438,116, Cl. 424-250.000.
Wiedemann, Fritz; Kampe, Wolfgang; Dietmann, Karl; and Sponer, Gisbert, 4,438,128, Cl. 424-273.00N.
Sprague, Clyde D., to Nordson Corporation. Retainable closure. 4,437,594, Cl. 222-544.000.
Sprague Electric Company: *See*—
Bernard, Walter J., 4,437,946, Cl. 204-35.00N.
Sells, Mary A.; and Scott, John W., 4,437,945, Cl. 204-35.00N.
Sprague, Robert A.: *See*—
Turner, William D.; and Sprague, Robert A., 4,438,461, Cl. 358-302.000.
Springs Industries, Inc.: *See*—
Daniels, John Y.; and Stevenson, James C., 4,438,169, Cl. 428-196.000.
Srinivasan, Nallaswamy: *See*—
Collins, Arthur K.; Andrews, Edward W.; and Srinivasan, Nallaswamy, 4,438,495, Cl. 364-414.000.
Stabile, Nicolo; Motta, Raimondo; and Gosso, Giancarlo, to Oxon Italia S.p.A. Process for synthesizing N-isopropyl-N'-o-carbomethoxyphenylsulphamide. 4,438,276, Cl. 560-13.000.
Stadler, Istvan: *See*—
Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Jozsef; Kekesi, Krisztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter; and Horvath, Karoly, 4,438,132, Cl. 424-285.000.
Stadler, Peter: *See*—
Petersen, Uwe; Stadler, Peter; Lockhoff, Oswald; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,438,260, Cl. 536-13.900.
Staebel, Raymond J.: *See*—
Peterman, Lee G.; and Staebel, Raymond J., 4,438,069, Cl. 422-62.000.
Stahl, Juergen; Schuster, Wilhelm; and Wegner, Wilhelm, to Gold- und Silber-Scheideanstalt Oberstein Franz Reischauer. Clasp for garments, in particular furs. 4,437,212, Cl. 24-698.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Gaida, Wolfram; and Hoefke, Wolfgang, to Boehringer Ingelheim KG. Substituted imidazo[1,2-a]pyrimidines and pharmaceutical compositions containing them. 4,438,118, Cl. 424-251.000.
Stahle, Helmut: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,438,143, Cl. 424-304.000.
Stained Glass Overlay, Inc.: *See*—
Butler, Donald R., 4,438,165, Cl. 428-38.000.
Stallman, Richard C. Outboard jet drive steering mechanism. 4,437,841, Cl. 440-42.000.
Stamicarbon B.V.: *See*—
Willems, Michael H.; and Vermijs, Winfried J. W., 4,438,083, Cl. 423-266.000.
Standard Oil Company (Indiana): *See*—
Dobry, Alan M., 4,437,997, Cl. 210-727.000.
Packer, Lawrence G.; and Schlossmacher, Edward J., 4,438,279, Cl. 562-416.000.
Stanley Electric Co., Ltd.: *See*—
Kato, Kazuhisa; and Yasui, Masaru, 4,438,154, Cl. 427-39.000.
Stanley, Philip E.: *See*—
Cushing, David E.; and Stanley, Philip E., 4,438,493, Cl. 364-200.000.
Stanley Works, The: *See*—
Elmore, James; and West, Robert F., 4,437,375, Cl. 83-762.000.
Stauffer Chemical Company: *See*—
Large, George B., 4,437,874, Cl. 71-87.000.
Staver, Paul L. Trailer mounted log splitter. 4,437,502, Cl. 144-193.00A.
Stavitsky, David; and Beres, Ernest A., to RCA Corporation. Mold for recorded disc. 4,437,641, Cl. 249-79.000.
Steag Kernenergie GmbH: *See*—
Bienek, Heinz; Finkbeiner, Rudolf; and Wick, Wilhelm, 4,437,578, Cl. 220-256.000.
Stebbins Engineering and Manufacturing Co.: *See*—
Macaleese, John E., 4,437,279, Cl. 52-247.000.
Steckel, Lester M.; and Thomsen, Valeria J. Tattooing gun. 4,437,361, Cl. 81-9.220.
Stegmeier, Alwin: *See*—
Leiber, Heinz; and Stegmeier, Alwin, 4,438,420, Cl. 335-275.000.
Stein, Alvin W. Self-adjusting self-locking hanger for pictures and the like. 4,437,639, Cl. 248-558.000.
Stein, Barry F.: *See*—
Flannery, William E.; Josephs, Richard M.; Stein, Barry F.; Wang, Tsing-Chow; and Young, Peter L., 4,437,227, Cl. 29-589.000.
Steinberger, Michael L., to Bell Telephone Laboratories, Incorporated. Adaptive cross-polarization interference cancellation system. 4,438,530, Cl. 455-278.000.
Steiner, Robert H.; and Touhsaent, Robert E., to Mobil Oil Corporation. Thermoplastic coated films with anti-static properties. 4,438,176, Cl. 428-349.000.
Stempel, John H. Chalkboard with hinged chalk rail. 4,437,839, Cl. 434-417.000.
Stenner, John W.: *See*—
Volk, Kurt E., Jr.; Herbert, Everett H.; and Stenner, John W., 4,437,852, Cl. 493-216.000.
Stephens, Donald E.; and Sharples, Thomas D., to Beckman Instruments, Inc. Packed column thermal reactor for an analytical instrument. 4,438,070, Cl. 422-70.000.
Stephens, James M.: *See*—
Kramer, James H.; Orndorff, Roy L., Jr.; and Stephens, James M., 4,437,688, Cl. 285-95.000.
Stern, Warren C., to Burroughs Wellcome Co. Reduction of cholesterol with meta-chloro α-t-butylaminopropiophenone. 4,438,138, Cl. 424-330.000.
Steuerwald, Manfred: *See*—
Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, 4,438,462, Cl. 360-2.000.
Stevens, Perry; and Brown, Robert E., to A.F.C.S., Inc. Feeding apparatus for fish and other animals. 4,437,595, Cl. 222-642.000.
Stevenson, James C.: *See*—
Daniels, John Y.; and Stevenson, James C., 4,438,169, Cl. 428-196.000.

Stewart, John C.: *See*—
King, Stephen J.; Moffatt, Bruce S.; and Stewart, John C., 4,437,984, Cl. 209-211.000.
Stier, Bernhard, to VDO Adolf Schindling AG. Device for producing an optical or acoustic shift instruction. 4,438,423, Cl. 340-52.00R.
Stitt, Robert M.; and Albaugh, Neil P., to Burr-Brown Research Corporation. Low profile optical coupling for an optoelectronic module. 4,438,338, Cl. 250-551.000.
Stockhaus, Klaus: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Gaida, Wolfram; and Hoefke, Wolfgang, 4,438,118, Cl. 424-251.000.
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., to In Situ Technology, Inc. Method for minimizing subsidence effects during production of coal in situ. 4,437,520, Cl. 166-261.000.
Stoffel, James C.: *See*—
Tandon, Jagdish C.; Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Stoffel, James C., 4,438,457, Cl. 358-213.000.
Stoller, David A., Jr.; Robertson, James C.; and Matyas, Tibor, to Portec, Inc. Pivotal slidable vehicle end enclosure. 4,437,410, Cl. 105-378.000.
Stoltefuss, Wilhelm, to Gewerkschaft Eisenhutte Westfalia. Cutting devices for mining and tunnelling machines. 4,437,708, Cl. 299-81.000.
Stolz, Albert; and Mordau, Manfred, to Daimler-Benz Aktiengesellschaft. Assembly compartment arranged between an engine compartment or trunk and a splash panel of a motor vehicle. 4,437,393, Cl. 98-2.170.
Stone & Webster Engineering Corp.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., 4,437,979, Cl. 208-153.000.
Storr, Rudolf, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Continuous wire feed arrangement for stapling apparatus. 4,437,600, Cl. 226-108.000.
Stouffer, Ronald D., to Bowles Fluidics Corporation. Sweeping air stream apparatus and method. 4,437,392, Cl. 9≈2.080.
Stover, William A.: *See*—
Chester, Arthur W.; McVeigh, Harry A.; and Stover, William A., 4,437,978, Cl. 208-120.000.
Strange, Rodney G.: *See*—
Sekel, Stephen M.; Strange, Rodney G.; and Verrinder, Robert F., 4,438,498, Cl. 364-483.000.
Straub, Gerald J. Movable truck bumper. 4,437,696, Cl. 293-118.000.
Strickler, Rainer: *See*—
Oppenlaender, Knut; Strickler, Rainer; Seib, Karl; and Naegele, Paul, 4,438,094, Cl. 424-59.000.
Strom, Alan R., to H & K Computer Corporation. Message waiting light control system. 4,438,506, Cl. 364-900.000.
Strom, Robert M., to Dow Chemical Company, The. Catalysts for oxidative coupling of phenols. 4,438,284, Cl. 568-730.000.
Struck, Gordon K. Portable bar-cabinet. 4,437,714, Cl. 312-281.000.
Strudwick, Thomas H.: *See*—
Bischoff, Bernard K.; Patrick, William J.; and Strudwick, Thomas H., 4,437,922, Cl. 156-603.000.
Stumpe, Werner, to Robert Bosch GmbH. Tire-pressure regulating system. 4,437,504, Cl. 152-427.000.
Suarato, Antonino; Penco, Sergio; Arcamone, Federico; and Casazza, Anna M., to Farmaitalia Carlo Erba S.p.A. 4'-Iododerivatives of anthracycline glycosides. 4,438,105, Cl. 424-180.000.
Sudo, Masami: *See*—
Shimada, Kazuo; Akiyama, Masataka; and Sudo, Masami, 4,438,093, Cl. 424-50.000.
Sudo, Ryoichi; Shoji, Fusaji; Watanabe, Takeshi; Suzuki, Kenkichi; and Ooue, Michio, to Hitachi, Ltd. Liquid crystal display device. 4,437,731, Cl. 350-340.000.
Sueishi, Motoharu: *See*—
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.
Suga, Michiharu: *See*—
Kashiwa, Norio; Morita, Yoshinori; and Suga, Michiharu, 4,438,243, Cl. 526-125.000.
Suga, Yozo: *See*—
Mori, Kensuke; Matsumoto, Hiromi; Suga, Yozo; Nakayama, Tadashi; and Matsumoto, Fumio, 4,437,909, Cl. 148-111.000.
Sugimoto, Soichiro: *See*—
Ito, Shinzo; Kato, Tateshi; Noma, Takumi; Sugimoto, Soichiro; and Toiyama, Seigi, 4,437,341, Cl. 73-119.00A.
Sugiura, Fumitoshi: *See*—
Suzuki, Akira; and Sugiura, Fumitoshi, 4,438,001, Cl. 252-8.700.
Sugiura, Hideaki: *See*—
Nozue, Shigehiro; Fukuoka, Tatsuhiko; and Sugiura, Hideaki, 4,437,215, Cl. 29-149.50R.
Suguri, Masayoshi; Yamada, Kazuo; and Nandate, Masaaki, to Kinyosha Co., Ltd. Press roll and manufacturing method therefor. 4,438,063, Cl. 264-311.000.
Suh, Kyung W.; Krueger, David C.; and Zehner, Burch E., to Dow Chemical Company, The. Method for the preparation of styrene polymer foam and foam prepared thereby. 4,438,224, Cl. 521-146.000.
Suling, Carlhans: *See*—
Schmitz-Josten, Robert; Suling, Carlhans; Podszun, Wolfgang; Boener, Bruno; Borgardt, Manfred; and Walkowiak, Michael, 4,437,836, Cl. 433-199.000.
Sumi, Akihiko: *See*—
Chibata, Ichiro; Sumi, Akihiko; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,438,044, Cl. 260-501.120.
Sumida, Seizo: *See*—
Takahashi, Junya; Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; Katoh, Haruhiko; and Sumida, Seizo, 4,437,880, Cl. 71-120.000.
Sumitomo Chemical Company, Limited: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Ogawa, Tadatoshi; Kotani, Kozo; and Hosono, Hidekazu, 4,438,238, Cl. 525-240.000.
Murase, Ichiki; Fujita, Fumio; Ohnishi, Toshihiro; and Tamura, Toshifumi, 4,438,262, Cl. 536-43.000.
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,437,877, Cl. 71-90.000.
Suzukamo, Gohfu; Tamura, Mitsuhisa; and Fukao, Masami, 4,438,286, Cl. 568-840.000.
Takahashi, Junya; Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; Katoh, Haruhiko; and Sumida, Seizo, 4,437,880, Cl. 71-120.000.
Sumitomo Metal Industries, Ltd.: *See*—
Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, 4,437,883, Cl. 75-0.50C.
Minami, Ryohei; Okamura, Shozo; Sunami, Yoshihiko; Hosoi, Takuji; and Kanou, Takuo, 4,437,974, Cl. 208-10.000.
Umino, Masahide; Tamura, Eijiro; Karasuno, Isamu; Ichidate, Minoru; and Kubo, Toshihiko, 4,437,891, Cl. 75-251.000.
Sumitomo Metal Mining Company Limited: *See*—
Nakano, Tadashi; Tamura, Hiroyuki; and Kubo, Naoki, 4,438,079, Cl. 423-87.000.
Sumitomo Naugatuck Co., Ltd.: *See*—
Fujimori, Yoshitugu; Takabori, Yasuo; Sakano, Hajime; and Ito, Akitoshi, 4,438,229, Cl. 524-109.000.
Sumitomo Special Metals Co., Ltd.: *See*—
Furukawa, Mitsuhiki; Miyahara, Michito; Kitahira, Takashi; Misumi, Kiyohito; Shiroyama, Masaharu; and Wada, Toshiaki, 4,438,213, Cl. 501-92.000.
Sunami, Yoshihiko: *See*—
Minami, Ryohei; Okamura, Shozo; Sunami, Yoshihiko; Hosoi, Takuji; and Kanou, Takuo, 4,437,974, Cl. 208-10.000.
Suncor, Inc.: *See*—
Yong, Raymond N., 4,437,998, Cl. 210-728.000.
Sunder-Plassmann, Paul: *See*—
Sielfeld, Gilbert; and Sunder-Plassmann, Paul, 4,438,244, Cl. 526-202.000.
Sundseth, Jarl. Air filters. 4,438,057, Cl. 264-46.500.
Sung, Rodney L.: *See*—
Zoleski, Benjamin H.; and Sung, Rodney L., 4,438,005, Cl. 252-33.400.
Surprenant, Richard P.: *See*—
Beers, Melvin D.; and Surprenant, Richard P., 4,438,039, Cl. 260-429.500.
Sussmeyer, Robert; Pluvinage, Alain; and Moenaert, Christian, to Ateliers Sussmeyer SPRL. Process for automatic and continuous vaporization and condensation. 4,437,940, Cl. 203-49.000.
Sutcliffe, Peter H.: *See*—
Fox, Hugh M.; and Sutcliffe, Peter H., 4,438,502, Cl. 364-718.000.
Suzukamo, Gohfu; Tamura, Mitsuhisa; and Fukao, Masami, to Sumitomo Chemical Company, Limited. Substituted esters and alcohols. 4,438,286, Cl. 568-840.000.
Suzuki, Akira; and Sugiura, Fumitoshi, to Takemotoyushi Co. Ltd. Oiling agent for treating synthetic fibers. 4,438,001, Cl. 252-8.700.
Suzuki, Akiyoshi, to Canon Kabushiki Kaisha. Alignment apparatus. 4,437,758, Cl. 355-41.000.
Suzuki, Hideo, to Okamura Corporation. Method and device for automatically controlling welding conditions for use in an arc welding machine. 4,438,318, Cl. 219-137.0PS.
Suzuki, Kenkichi: *See*—
Sudo, Ryoichi; Shoji, Fusaji; Watanabe, Takeshi; Suzuki, Kenkichi; and Ooue, Michio, 4,437,731, Cl. 350-340.000.
Suzuki, Masahiro: *See*—
Hayasaka, Tadao; Suzuki, Masahiro; Ozawa, Shigeru; and Takeya, Yoshiaki, 4,437,890, Cl. 75-244.000.
Suzuki, Osamu; Yamaguchi, Kunio; and Yamamoto, Meguru, to Toyooko Kogyo Kabushiki Kaisha. Pneumatic-hydraulic system for hydraulic actuator. 4,437,309, Cl. 60-547.100.
Suzuki, Shin; and Sato, Toshihiko, to NGK Spark Plug Co., Ltd. Auxiliary combustion chamber preheating device. 4,437,440, Cl. 123-145.00A.
Suzuki, Shizuo: *See*—
Iwamoto, Yoshinao; Suzuki, Shizuo; and Shirasaki, Yuichi, 4,438,401, Cl. 324-326.000.
Suzuki, Shuichi: *See*—
Hayase, Shuzi; and Suzuki, Shuichi, 4,437,959, Cl. 204-159.110.
Suzuki, Takashi; and Ito, Susumu, to Canon Kabushiki Kaisha. Quick return beam splitter for a single lens reflex camera. 4,437,740, Cl. 354-476.000.
Suzuki, Yukio: *See*—
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.
Svatek, Katherine H.; Wilson, David A.; and Griffin, Freddie, Jr., to Dow Chemical Company, The. Process for making aminopolycarboxylic acid chelates of iron. 4,438,040, Cl. 260-439.00R.

Svensk Ideutveckling Handelsbolag: *See*—
Johannson, Arne, 4,437,609, Cl. 236-49.000.
Sylvia, Frank, to Pace Incorporated. Ceramic coated electric heater assembly for tools. 4,438,322, Cl. 219-236.000.
Synthelabo: *See*—
Obitz, Daniel, 4,438,121, Cl. 424-258.000.
Syroco, Inc.: *See*—
Brescia, Tony; and Deacon, Ross, 4,437,414, Cl. 108-134.000.
Szahler, David J., to A Packaging Service Company, Inc. Child proof container. 4,437,566, Cl. 206-1.500.
Szekely, Istvan: *See*—
Galambos, Gaza; Simonidesz, Vilmos; Szekely, Istvan; Ivanics, Jozsef; Kekesi, Kriaztina; Kovacs, Gabor; Stadler, Istvan; Kormoczy, Peter; and Horvath, Karoly, 4,438,132, Cl. 424-285.000.
Tabata, Setsuko: *See*—
Satsuki, Teruhisa; Ota, Seiiti; and Tabata, Setsuko, 4,438,025, Cl. 252-545.000.
Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid-state color imager with three layer four story structure. 4,438,455, Cl. 358-44.000.
Taber, Bruce D.; and Wagner, James B., to General Electric Company. HRSG Damper control. 4,437,313, Cl. 60-665.000.
Tabor, Edward; and Gerety, Robert J., to United States of America, Health and Human Services. Heat treatment of a non-A, non-B hepatitis agent to prepare a vaccine. 4,438,098, Cl. 424-89.000.
Taggart, Robert E.: *See*—
Taggart, Thomas D.; and Taggart, Robert E., 4,437,488, Cl. 13[illegible]334.000.
Taggart, Thomas D.; and Taggart, Robert E., to Lockwood Technical Inc. Solenoid valve for hot melt material. 4,437,488, Cl. 137-334.000.
Taiho Kogyo Co., Ltd.: *See*—
Nozue, Shigehiro; Fukuoka, Tatsuhiko; and Sugiura, Hideaki, 4,437,215, Cl. 29-149.50R.
Taiyo Yuden Co., Ltd.: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,438,214, Cl. 501-136.000.
Tajana, Alberto: *See*—
Nardi, Dante; Tajana, Alberto; Motta, Gianni; Cazzulani, Pietro; and Graziani, Gabriele, 4,438,133, Cl. 424-300.000.
Tajkowski, Edward G., to Allied Corporation. Solvent dewatering composition. 4,438,026, Cl. 252-545.000.
Takabori, Yasuo: *See*—
Fujimori, Yoshitugu; Takabori, Yasuo; Sakano, Hajime; and Ito, Akitoshi, 4,438,229, Cl. 524-109.000.
Takada, Norihisa: *See*—
Nelson, Philip E.; and Takada, Norihisa, 4,437,934, Cl. 159-47.100.
Takagi, Mitiro: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, 4,438,115, Cl. 424-250.000.
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Method and apparatus for controlling the fuel feeding rate of an internal combustion engine. 4,437,445, Cl. 123-491.000.
Takahashi, Junya; Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; Katoh, Haruhiko; and Sumida, Seizo, to Sumitomo Chemical Company, Limited. N'-Phenyl-N-methylurea derivatives. 4,437,880, Cl. 71-120.000.
Takahashi, Keiichi: *See*—
Tomita, Fusao; Matsuda, Yuzuru; Shirahata, Kunikatsu; Takahashi, Keiichi; Nakano, Hirofumi; Sato, Tomoyasu; Okubo, Shuji; and Nakamura, Nobuo, 4,438,197, Cl. 435-119.000.
Takahashi, Masayoshi: *See*—
Nomoto, Reishi; Akimoto, Masahiro; and Takahashi, Masayoshi, 4,437,465, Cl. 128-340.000.
Takahashi, Mitsuo: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Takahashi, Mitsuo; Asada, Hideki; and Kurahashi, Masaru, 4,438,041, Cl. 260-464.000.
Takahashi, Tomowaki; Konno, Kunio; and Sasaya, Toshihiro, to Nippon Kogaku K.K. Zoom lens. 4,437,733, Cl. 350-427.000.
Takamiya, Toru: *See*—
Miyashita, Takao; Aizawa, Hidekuni; and Takamiya, Toru, 4,437,778, Cl. 400-208.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,438,113, Cl. 424-246.000.
Takata, Masahiro; Aoki, Ryuji; and Sato, Takahisa, to Nippin Shokubai Kagako Kogyo Co., Ltd. Catalyst for oxidation of propylene. 4,438,217, Cl. 502-205.000.
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, to Fujisawa Pharmaceutical Co., Ltd. 7-Acylaminocephalosporanic acid derivatives. 4,438,113, Cl. 424-246.000.
Takeda Chemical Industries, Ltd.: *See*—
Kawamatsu, Yutaka; and Fujita, Takeshi, 4,438,141, Cl. 424-248.510.
Takei, Hiroshi: *See*—
Phillips, Jeffrey; and Takei, Hiroshi, 4,438,481, Cl. 361-433.000.
Takemoto, Ichiki: *See*—
Takahashi, Junya; Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; Katoh, Haruhiko; and Sumida, Seizo, 4,437,880, Cl. 71-120.000.
Takemotoyushi Co. Ltd.: *See*—
Suzuki, Akira; and Sugiura, Fumitoshi, 4,438,001, Cl. 252-8.700.
Takeshima, Masaki: *See*—
Kikkawa, Ryozo; and Takeshima, Masaki, 4,437,933, Cl. 159-17.00R.
Takeya, Yoshiaki: *See*—
Hayasaka, Tadao; Suzuki, Masahiro; Ozawa, Shigeru; and Takeya, Yoshiaki, 4,437,890, Cl. 75-244.000.
Taki, Yasuo: *See*—
Araki, Shigeru; Taki, Yasuo; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,437,232, Cl. 29-740.000.
Tamborski, Christ: *See*—
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,438,006, Cl. 252-49.900.
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,438,007, Cl. 252-49.900.
Tameris, Hendrikus M.: *See*—
van der Ploeg, Dirk C. H.; and Tameris, Hendrikus M., 4,437,787, Cl. 425-84.000.
Tamura, Eijiro: *See*—
Umino, Masahide; Tamura, Eijiro; Karasuno, Isamu; Ichidate, Minoru; and Kubo, Toshihiko, 4,437,891, Cl. 75-251.000.
Tamura, Hidemasa: *See*—
Ishikawa, Reiji; Saito, Masaki; Mori, Toshio; and Tamura, Hidemasa, 4,438,160, Cl. 427-214.000.
Tamura, Hifumi: *See*—
Hosoki, Shigeyuki; Futamoto, Masaaki; Kawabe, Ushio; Ishitani, Tohru; and Tamura, Hifumi, 4,438,371, Cl. 315-111.810.
Tamura, Hiroyuki: *See*—
Nakano, Tadashi; Tamura, Hiroyuki; and Kubo, Naoki, 4,438,079, Cl. 423-87.000.
Tamura, Hisashi; Ito, Ichizo; Hirayama, Masashi; and Ando, Tetsuo, to Yokogawa Hokushin Electric Corporation. Vortex flow metering apparatus. 4,437,350, Cl. 73-861.240.
Tamura, Mitsuhisa: *See*—
Suzukamo, Gohfu; Tamura, Mitsuhisa; and Fukao, Masami, 4,438,286, Cl. 568-840.000.
Tamura, Toshifumi: *See*—
Murase, Ichiki; Fujita, Fumio; Ohnishi, Toshihiro; and Tamura, Toshifumi, 4,438,262, Cl. 536-43.000.
Tan, Yui-Kuan: *See*—
Komada, Kenya; and Tan, Yui-Kuan, 4,438,444, Cl. 346-155.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Sumi, Akihiko; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,438,044, Cl. 260-501.120.
Gaino, Mitsunori; Iijima, Ikuo; Nishimoto, Shigeru; Ikeda, Kuichiro; and Fujii, Tokuo, 4,438,035, Cl. 260-239.30B.
Tanaka, Akihiro: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Tanaka, Akihiro, 4,438,109, Cl. 424-180.000.
Tanaka, Chiaki; Nakashima, Shinobu; and Kondow, Makoto, to Toray Industries, Incorporated. Polyamide elastomer. 4,438,240, Cl. 525-420.000.
Tanaka, Hidetoshi: *See*—
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.
Tanaka, Itsuo: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,437,324, Cl. 68-5.00E.
Tanaka, Minoru: *See*—
Terahara, Akira; Hamano, Kiyoshi; Tsujita, Yoshio; and Tanaka, Minoru, 4,438,277, Cl. 560-119.000.
Tanaka, Souhei: *See*—
Araki, Shigeru; Taki, Yasuo; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,437,232, Cl. 29-740.000.
Tanaka, Tosio, to Tokyo Shibaura Denki Kabushiki Kaisha. Motor drive apparatus. 4,438,378, Cl. 318-280.000.
Tanaka, Yoshio. Expanding process. 4,438,058, Cl. 264-51.000.
Tanaka, Yukio: *See*—
Araki, Masatada; and Tanaka, Yukio, 4,437,800, Cl. 407-119.000.
Tandon, Jagdish C.; Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Stoffel, James C., to Xerox Corporation. High resolution imager employing staggered sensor structure. 4,438,457, Cl. 358-213.000.
Tani, Mitsukiyo: *See*—
Kobayashi, Mamoru; Ishige, Kanji; Sasaki, Hideaki; Tani, Mitsukiyo; and Kawakami, Yashuhiko, 4,437,603, Cl. 228-4.500.
Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Camera capable of automatically responding to data coded on film. 4,437,742, Cl. 354-21.000.
Tannetics, Inc.: *See*—
Iannelli, Frank M., 4,437,319, Cl. 62-138.000.
Tantalo, Anthony T. Fuel saving device for increasing fuel mileage on a moving vehicle. 4,437,698, Cl. 296-1.00S.
Tao, Thomas M.; and Bean, William C. Control of bulk in air laid fibrous webs. 4,437,917, Cl. 156-296.000.
Tarjan, Peter P.: *See*—
Saulson, Stanley H.; Schroeppel, Edward A.; and Tarjan, Peter P., 4,437,466, Cl. 128-419.0PS.
Tashiro, Minoru, to Bunri Industry Co., Ltd. Filter apparatus. 4,437,991, Cl. 210-413.000.
Taskier, Henry T., to Celanese Corporation. Hydrophilic polymer coated microporous membranes capable of use as a battery separator. 4,438,185, Cl. 429-250.000.
Tassie, Douglas P., to General Electric Company. Gun mount. 4,437,384, Cl. 89-37.00A.
Tateishi, Arthur K. Directional air flow fan. 4,437,394, Cl. 98-40.00V.
Tateishi, Junji; Ishikawa, Takeharu; Nakano, Shozaburo; and Nishiyama, Noboru, to Kawasaki Steel Corporation. Flux composition

for electro-slag over-lay welding of a cylindrical vessel with a strip electrode. 4,437,906, Cl. 148-26.000.
Tauber, Randolph T.: *See*—
Tauber, Robert T.; and Tauber, Randolph T., 4,437,838, Cl. 434-363.000.
Tauber, Robert T.; and Tauber, Randolph T., to TTK Communication Products. Apparatus for preparing examinations. 4,437,838, Cl. 434-363.000.
Taubman, Martin A.; and Smith, Daniel J., to Forsyth Dental Infirmary for Children. Method for the preparation of glucosyltranferase. 4,438,200, Cl. 435-193.000.
Tavares, Donald F.: *See*—
Boorman, Philip M.; Chivers, Tristram; Tavares, Donald F.; and Mahadev, Kalabeerappa N., 4,438,218, Cl. 502-220.000.
Tayler, Gerald E.: *See*—
Hartung, Michael H.; Rieck, Richard E.; and Tayler, Gerald E., 4,438,512, Cl. 371-60.000.
Taylor, Julian S. Poppet check valve. 4,437,492, Cl. 137-543.130.
Taylor, William M.: *See*—
Brakhage, William L., Jr.; and Taylor, William M., 4,437,643, Cl. 251-1.00A.
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Induction heating cooking apparatus. 4,438,311, Cl. 219-10.49R.
Teague, W. Dorwin: *See*—
Marinoff, Gerald P.; and Teague, W. Dorwin, 4,437,546, Cl. 182-233.000.
Technicon Instruments Corporation: *See*—
Engler, Philip V.; and Buhl, Steven N., 4,438,202, Cl. 436-8.000.
Forrest, Gordon C., 4,438,068, Cl. 422-61.000.
Technology Marketing Inc.: *See*—
Dyer, David; and Wise, James L., 4,437,316, Cl. 62-79.000.
Techsight Corporation: *See*—
Weber, Hermann, 4,438,159, Cl. 427-162.000.
Teijin Limited: *See*—
Yamaguchi, Taturo; and Minemura, Norihiro, 4,438,151, Cl. 427-36.000.
Tektronix, Inc.: *See*—
Philipp, Harald, 4,438,404, Cl. 328-63.000.
Sekel, Stephen M.; Strange, Rodney G.; and Verrinder, Robert F., 4,438,498, Cl. 364-483.000.
Telebit Corporation: *See*—
Baran, Paul, 4,438,511, Cl. 370-19.000.
Telefonaktiebolaget L M Ericsson: *See*—
Morwing, Bo A., 4,438,392, Cl. 324-79.00R.
Telefunken Electronic GmbH: *See*—
Colquhoun, Alexander; and Kohn, Erhard, 4,438,445, Cl. 357-14.000.
Malinowski, Christopher W.; and Rinderle, Heinz, 4,438,412, Cl. 331-2.000.
Temme, Helmut: *See*—
Redder, Manfred; Linke, Horst; Grundken, Dieter; and Temme, Helmut, 4,437,564, Cl. 198-834.000.
Temple, Eugene A.; and Pestlin, Norman F. Plastic pipe heater. 4,437,453, Cl. 126-271.20R.
Teradyne, Inc.: *See*—
Katz, Jonathon H., 4,438,397, Cl. 324-158.00P.
Terahara, Akira; Hamano, Kiyoshi; Tsujita, Yoshio; and Tanaka, Minoru, to Sankyo Company, Limited. Hydronaphthalene derivatives. 4,438,277, Cl. 560-119.000.
Teraoka, Masanori; Komaki, Takao; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Noise erasing apparatus for stimulable phosphor sheet. 4,438,333, Cl. 250-327.200.
Terauchi, Kiyoshi; and Hiraga, Masaharu, to Sanden Corporation. Scroll type fluid compressor unit with axial end surface sealing means. 4,437,820, Cl. 418-55.000.
Terauchi, Takashi: *See*—
Okada, Yoshio; Terauchi, Takashi; Naoki, Makoto; and Hino, Masatoshi, 4,438,021, Cl. 502-341.000.
Terry, Ruel C.: *See*—
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,437,520, Cl. 166-261.000.
Terui, Nobuhiko; and Magariyama, Kenichi, to Nippon Kogaku K.K. Automatic exposure control apparatus for camera. 4,437,744, Cl. 354-442.000.
Tessler, Martin M.; and Neigel, Dennis V., to National Starch and Chemical Corporation. Process for the preparation of an aqueous 3-chloro-2-sulfopropionic acid reagent. 4,438,047, Cl. 260-513.00R.
Testard, Olivier, to Commissariat a l'Energie Atomique. Composite heat shield. 4,438,168, Cl. 428-193.000.
Texaco Inc.: *See*—
Brandenburg, John T.; and Crone, John M., Jr., 4,438,219, Cl. 502-333.000.
Johnson, Fred L., Jr., 4,438,281, Cl. 564-477.000.
Nieh, Edward C. Y.; and Naylor, Carter G., 4,438,045, Cl. 260-501.130.
Roberts, Roy D., 4,437,417, Cl. 110-346.000.
Schievelbein, Vernon H.; and Zabczuk, Paul, 4,438,002, Cl. 252-8.55D.
Zoleski, Benjamin H.; and Sung, Rodney L., 4,438,005, Cl. 252-33.400.
Texas Instruments Incorporated: *See*—
Woodard, Thomas R.; and Martin, Kenneth L., 4,438,320, Cl. 219-216.000.
Textron Inc.: *See*—
LaBruna, Anthony J., 4,437,590, Cl. 222-386.500.
Tezuka, Akitomi. Rice-body shaping device for rolled sushi. 4,437,826, Cl. 425-182.000.
Thermal Systems Limited: *See*—
Fischer, Victor H., 4,437,308, Cl. 60-514.000.
Thermo Electric Co., Inc.: *See*—
Wells, Alfred E., Jr.; and Casillo, James H., 4,438,290, Cl. 136-221.000.
Thier, Alfons: *See*—
Schmittmann, Hans-Bernd; and Thier, Alfons, 4,438,028, Cl. 252-609.000.
Thiokol Corporation: *See*—
Adams, Gary V.; and Schneiter, Fred E., 4,437,681, Cl. 280-733.000.
Guziec, Frank S., Jr., 4,438,269, Cl. 546-9.000.
Thoemke, Lloyd C.: *See*—
Myers, James F.; and Thoemke, Lloyd C., 4,437,577, Cl. 220-224.000.
Thomalla, Richard O., to Conwed Corporation. Automatic volume and frequency controlled sound masking system. 4,438,526, Cl. 381-73.000.
Thomas & Betts Corporation: *See*—
Narozny, Ronald S., 4,437,723, Cl. 339-99.00R.
Thomas, Donald K., Jr. Wall partition locking system. 4,437,278, Cl. 52-239.000.
Thomas, Erwin: *See*—
Rapp, Guenther; Thomas, Erwin; and Muenster, Rolf, 4,438,084, Cl. 423-387.000.
Thomas, Millicent H.: *See*—
Pickens, John W.; Abraham, John K.; Mintus, Raymond E.; and Thomas, Millicent H., 4,437,902, Cl. 148-12.00F.
Thompson, Charles E., to Huyck Corporation. Papermakers fabrics having equalized warp sew-up. 4,437,496, Cl. 139-383.00A.
Thomsen, Valeria J.: *See*—
Steckel, Lester M.; and Thomsen, Valeria J., 4,437,361, Cl. 81-9.220.
Thomson-Brandt: *See*—
Colineau, Joseph; and Maheo, Jean Y., 4,438,375, Cl. 315-408.000.
Thomson-CSF: *See*—
Blachot, Denis, 4,438,414, Cl. 333-28.00T.
Thorn, Brent: *See*—
Thorn, E. R.; and Thorn, Brent, 4,437,648, Cl. 254-93.00R.
Thorn, E. R.; and Thorn, Brent, to Van F. Belknap Co. Belt tensioning tool. 4,437,648, Cl. 254-93.00R.
Thornton, Donald I.: *See*—
Hutchins, Charles K.; Thornton, Donald I.; and Peyton, Richard H., 4,437,986, Cl. 210-130.000.
Thornton, Jack L. Truss assembling gantry. 4,437,234, Cl. 29-798.000.
Thornton, Marvin L.; and Boyt, Arthur J., Jr. Anaerobic digester gas collection and storage systems. 4,437,987, Cl. 210-137.000.
Three Sisters Ranch Enterprises: *See*—
Bullock, Joseph J., III, 4,437,593, Cl. 222-541.000.
Thurston, Inc.: *See*—
Shook, William B., 4,437,596, Cl. 224-39.000.
Thyssen Aktiengesellschaft Vorm.August Thyssen-Hutte: *See*—
Weber, Richard A.; and Schutz, Carl-Heinz, 4,437,652, Cl. 266-275.000.
Tigane, Rein K., to Upravlenie Sanitarno-Tekhnicheskikh Rabot. Rotary machine with an axially moving partition. 4,437,823, Cl. 418-219.000.
TII Industries, Inc.: *See*—
Cawley, John M., 4,438,477, Cl. 361-119.000.
Schleimann-Jensen, C. Arne, 4,437,845, Cl. 445-39.000.
Timmerman, Terry: *See*—
Bigelow, David E.; and Timmerman, Terry, 4,437,646, Cl. 251-145.000.
Titeflex Corporation: *See*—
Goebel, Mark B.; and Lefebvre, Kenneth E., 4,437,689, Cl. 285-246.000.
Toda Kogyo Corp.: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,437,881, Cl. 75-0.5AA.
Togo, Yasuhiko: *See*—
Kuranishi, Masaaki; and Togo, Yasuhiko, 4,438,328, Cl. 235-181.000.
Tohei, Nobuo: *See*—
Ishigami, Hideo; and Tohei, Nobuo, 4,437,372, Cl. 83-320.000.
Tohyama, Yashikuni: *See*—
Kawakubo, Kazuo; Furuichi, Katsushi; Namekata, Kiyokazu; Tanaka, Hidetoshi; Tohyama, Yashikuni; Kasamura, Toshirou; Aoki, Tomohiro; and Honma, Toshio, 4,437,756, Cl. 355-14.00R.
Toiyama, Seigi: *See*—
Ito, Shinzo; Kato, Tateshi; Noma, Takumi; Sugimoto, Soichiro; and Toiyama, Seigi, 4,437,341, Cl. 73-119.00A.
Tokico Ltd.: *See*—
Ashiba, Masahiro, 4,437,548, Cl. 188-289.000.
Tokita, Tsugio: *See*—
Hasegawa, Kokichi; and Tokita, Tsugio, 4,437,406, Cl. 101-350.000.
Tokyo Electric Co., Ltd.: *See*—
Ochiai, Kuniaki; Horii, Masami; and Ishii, Hidekazu, 4,437,775, Cl. 400-124.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,438,311, Cl. 219-10.49R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hayase, Shuzi; and Suzuki, Shuichi, 4,437,959, Cl. 204-159.110.
Matsuyama, Kouszou, 4,438,478, Cl. 361-152.000.
Mizutani, Yoshihisa, 4,437,225, Cl. 29-576.00B.
Narita, Ryuho; Yamamori, Kenji; Oota, Hiroyuki; and Aoshima, Terutaka, 4,438,324, Cl. 219-441.000.
Ohmura, Hideo, 4,437,571, Cl. 209-551.000.
Sano, Jun; Aoyama, Masahide; and Kubo, Daijiro, 4,438,353, Cl. 307-477.000.
Sasaki, Hiroshi, 4,437,348, Cl. 73-625.000.
Shibayama, Shigeki; and Iwata, Kazuhide, 4,438,488, Cl. 364-200.000.
Tanaka, Tosio, 4,438,378, Cl. 318-280.000.
Yamaguchi, Tetsuo, 4,437,380, Cl. 84-1.260.
Yamashita, Kiyofumi; and Kodama, Toshikazu, 4,438,417, Cl. 333-193.000.

Tomim, William L. On-line telephone troubleshooting apparatus. 4,438,299, Cl. 179-175.30F.

Tomita, Fusao; Matsuda, Yuzuru; Shirahata, Kunikatsu; Takahashi, Keiichi; Nakano, Hirofumi; Sato, Tomoyasu; Okubo, Shuji; and Nakamura, Nobuo, to Kyowa Hakko Kogyo Co., Ltd. Compound DC-38-V and process for production thereof. 4,438,197, Cl. 435-119.000.

Tomm, Dagwin; and Scheer, Erich, to Fichtel & Sachs AG. Multiple disk clutch with spring control lift. 4,437,555, Cl. 192-70.210.

Tompkins, Elliot N.; and Kline, Sherman S., to Datapoint Corporation. Word processor—controlled printer output scanner mechanism. 4,437,660, Cl. 271-290.000.

Tomura, Teruichi: *See*—
Watanabe, Yoshio; Yamane, Mikiya; and Tomura, Teruichi, 4,438,373, Cl. 315-334.000.

Tomy Kogyo Co., Inc.: *See*—
Kaga, Takashi, 4,437,262, Cl. 46-242.000.

Toray Industries, Inc.: *See*—
Katsutoshi, Ando; and Eiichi, Nishiura, 4,438,172, Cl. 428-220.000.
Tanaka, Chiaki; Nakashima, Shinobu; and Kondow, Makoto, 4,438,240, Cl. 525-420.000.

Torres, Julio B. Stop control mechanism for feeding a material to a work performing machine. 4,437,422, Cl. 112-272.000.

Toshiba Heating Appliances Co., Ltd.: *See*—
Amano, Kazunori; and Sekiwaga, Youichi, 4,437,832, Cl. 431-304.000.

Touhsaent, Robert E.: *See*—
Steiner, Robert H.; and Touhsaent, Robert E., 4,438,176, Cl. 428-349.000.

Toyama, Masamichi, to Canon Kabushiki Kaisha. Spring clutch device. 4,437,552, Cl. 192-26.000.

Toyo Kogyo Co., Ltd.: *See*—
Nishikori, Tsutomu; and Yoshiki, Yasuo, 4,437,703, Cl. 297-362.000.

Toyo Umpanki Co., Ltd.: *See*—
Urabe, Sumio, 4,437,531, Cl. 180-79.100.

Toyoda, Hiroyasu; Komiya, Hiroyoshi; and Itakura, Hideaki, to VLSI Technology Research Association. High selectivity plasma etching apparatus. 4,438,315, Cl. 219-121.0PE.

Toyoda Koki Kabushiki Kaisha: *See*—
Nakamura, Keiichi; Haga, Kyosuke; and Mori, Yutaka, 4,437,532, Cl. 180-142.000.

Toyomura, Shigeru, to Canon Kabushiki Kaisha. Electronic device having warning means. 4,438,431, Cl. 340-663.000.

Toyooko Kogyo Kabushiki Kaisha: *See*—
Suzuki, Osamu; Yamaguchi, Kunio; and Yamamoto, Meguru, 4,437,309, Cl. 60-547.100.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,437,358, Cl. 74-867.000.
Miura, Hirohisa; Satou, Hiroshi; and Natsume, Toshio, 4,437,886, Cl. 75-67.00R.
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Isomura, Shigenori; Kobayashi, Akio; Kato, Katsushi; Kowada, Ichiro; and Nishii, Sachio, 4,437,446, Cl. 123-492.000.
Moriya, Shigeru; Yoshida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Tsuge, Hiroshi, 4,437,683, Cl. 280-804.000.
Moriya, Shigeru; Yoshida, Akio; Matsunami, Muncharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, 4,437,684, Cl. 280-804.000.

Transamerica DeLaval Inc.: *See*—
Reese, Ira W.; and Compagnucci, Nello B., 4,437,213, Cl. 29-33.00K.

Traunecker, Werner: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Muacevic, Gojko; and Traunecker, Werner, 4,438,143, Cl. 424-304.000.

Trautsch, Jerrold A., to Leer Manufacturing Company, Inc. Folding pallet. 4,437,412, Cl. 108-56.100.

Treber, Norbert, to Heraeus Quarzschmelze GmbH. Quartz glass envelope tube. 4,437,727, Cl. 350-96.300.

Treiber, Hans J.: *See*—
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

Tremaglio, Anthony M.: *See*—
Albert, Donald; and Tremaglio, Anthony M., 4,438,344, Cl. 307-146.000.

Tri Tool, Inc.: *See*—
Astle, William H., 4,437,366, Cl. 82-4.00C.

Trick, Robert E.; and Weeks, Vaughan B., to Medical Engineering Corporation. Artificial sphincter with improved pressure control valve. 4,437,457, Cl. 128-1.00R.

Trimedyne, Inc.: *See*—
Schmer, Gottfried, 4,438,198, Cl. 435-178.000.

Trop, Timothy N. Buoyancy compensator. 4,437,790, Cl. 405-186.000.

Trost, Wayne C., to Barber-Colman Company. Triaxial fabric. 4,438,173, Cl. 428-221.000.

Truzzi, Ferdinando; and Premi, Mauro, to Mesdan S.p.A. Apparatus for joining textile threads with the aid of compressed air, for mounting on an automatic winding machine. 4,437,298, Cl. 57-22.000.

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TRW Inc.: *See*—
Harrington, Alan L.; Allison, Richard; and Rodov, Vladimir, 4,438,448, Cl. 357-23.000.

Tsang, Won-Tien, to Bell Telephone Laboratories, Incorporated. Double barrier double heterostructure laser. 4,438,446, Cl. 357-17.000.

Tsuchida, Takashi; Kondo, Nobuo; Okada, Kazukiyo; and Okuda, Yutaka, to Nippondenso Co., Ltd. Multiple signal transmitting apparatus for automobiles. 4,438,425, Cl. 340-55.000.

Tsuchiya, Tsutomu: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Tanaka, Akihiro, 4,438,109, Cl. 424-180.000.
Watanabe, Isamu; Yamaguchi, Takashi; Kamiya, Kazuhiro; Mori, Toshihito; Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,438,107, Cl. 424-180.000.

Tsuge, Hiroshi: *See*—
Moriya, Shigeru; Yoshida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Tsuge, Hiroshi, 4,437,683, Cl. 280-804.000.
Moriya, Shigeru; Yoshida, Akio; Matsunami, Muncharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, 4,437,684, Cl. 280-804.000.

Tsui, Tien-Fung, to Mobil Oil Corporation. Two stage selective oxidative leach method to separately recover uranium and refractory uranium-mineral complexes. 4,438,077, Cl. 423-7.000.

Tsujita, Yoshio: *See*—
Terahara, Akira; Hamano, Kiyoshi; Tsujita, Yoshio; and Tanaka, Minoru, 4,438,277, Cl. 560-119.000.

Tsukada, Katsushige: *See*—
Ishimaru, Toshiaki; Tsukada, Katsushige; and Hayashi, Nobuyuki, 4,438,190, Cl. 430-281.000.

Tsuneno, Hiroshi: *See*—
Yamamoto, Hideharu; and Tsuneno, Hiroshi, 4,437,228, Cl. 29-590.000.

Tsutsumi, Shigeru. Injection molding process for synthetic resin and its apparatus. 4,438,064, Cl. 264-328.150.

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Tauber, Robert T.; and Tauber, Randolph T., 4,437,838, Cl. 434-363.000.

Tucker, John G.; and Wells, Hugh A., to Western Electric Co., Inc. Methods of and apparatus for pumping solder. 4,437,605, Cl. 228-180.00R.

Tucker, Russell E.: *See*—
Fancey, Everett G.; Peters, John V.; and Tucker, Russell E., 4,437,254, Cl. 43-4.000.

Tuebner, Helwig: *See*—
Balser, Klaus; Tuebner, Helwig; and Oppermann, Wilhelm, 4,438,264, Cl. 536-91.000.

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Ponticello, Ignazio S.; Hollister, Kenneth R.; and Tuites, Richard C., 4,438,278, Cl. 560-205.000.

Turke, Wolfgang: *See*—
Pietsch, Hartmut; Turke, Wolfgang; Bareuther, Ernst; Kampf, Fritz; and Bings, Hubert, 4,438,076, Cl. 423-30.000.

Turner, William D.; and Sprague, Robert A., to Xerox Corporation. Integrated input/output scanner for electronic document processing. 4,438,461, Cl. 358-302.000.

Turro, Jerome; and Nelson, Peter. Safety guard. 4,437,265, Cl. 49-57.000.

Ty, Perla J. Separator disc and hypodermic syringe incorporating the same and method. 4,437,858, Cl. 604-90.000.

Tyler, Derek E.: *See*—
Pryor, Michael J.; and Tyler, Derek E., 4,437,508, Cl. 164-418.000.

Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., 4,437,317, Cl. 62-81.000.

UBE Industries, Ltd.: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Takahashi, Mitsuo; Asada, Hideki; and Kurahashi, Masaru, 4,438,041, Cl. 260-464.000.

Uchida, Yasuo, to Omron Tateisi Electronics Company. System for performing transactions. 4,438,326, Cl. 235-379.000.

Uchiumi, Shinichiro: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Takahashi, Mitsuo; Asada, Hideki; and Kurahashi, Masaru, 4,438,041, Cl. 260-464.000.

Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, to Fujisawa Pharmaceutical Co., Ltd. Lower alkanoic acid derivatives of 2-oxo-benzoxazolines and aldose reductase inhibiting compositions thereof. 4,438,126, Cl. 424-272.000.

Ueda, Kazuo: *See*—
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.

Ueda, Makoto: *See*—
Shida, Masaharu; Ueda, Makoto; Otawa, Shuji; Mandai, Masaaki; and Sato, Katsuhiko, 4,437,769, Cl. 368-204.000.

Ueda, Shuso: *See*—
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, 4,437,304, Cl. 60-290.000.

Ueguri, Shigeo; Komura, Hirotsugu; and Mizuno, Takaji, to Mitsubishi Denki Kabushiki Kaisha. Pulse arc welding machine. 4,438,317, Cl. 219-130.510.

Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; and Kida, Shuji, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive color photographic material. 4,438,193, Cl. 430-505.000.

Uhler, Marcus H.: *See*—
Cawley, James C.; DiMartino, Michael D.; Fisher, Thomas J.; King, Roger L.; and Uhler, Marcus H., 4,438,473, Cl. 361-18.000.

Ulveling, Leon; Legille, Edouard; and Boever, Jean, to Paul Wurth S.A. Pneumatic transport procedure and apparatus. 4,437,796, Cl. 406-25.000.

Umehara, Yozaburo. Method of manufacturing tape guides for recording and/or reproducing apparatus. 4,437,222, Cl. 29-527.400.

Umemura, Shizuo; Matsufuji, Akihiro; Aonuma, Masashi; Kitamoto, Tatsuji; and Miyatsuka, Hajime, to Fuji Photo Film Co., Ltd. Ferromagnetic powder treated with an organic silane compound. 4,437,882, Cl. 75-0.50R.

Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Tanaka, Akihiro, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Tylosin derivatives. 4,438,109, Cl. 424-180.000.

Umezawa, Hamao: *See*—
Watanabe, Isamu; Yamaguchi, Takashi; Kamiya, Kazuhiro; Mori, Toshihito; Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,438,107, Cl. 424-180.000.

Umezawa, Kazumi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,437,757, Cl. 355-15.000.

Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Tanaka, Akihiro, 4,438,109, Cl. 424-180.000.
Watanabe, Isamu; Yamaguchi, Takashi; Kamiya, Kazuhiro; Mori, Toshihito; Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,438,107, Cl. 424-180.000.

Umholtz, Walter F.: *See*—
Fawkes, John S.; and Umholtz, Walter F., 4,438,466, Cl. 360-66.000.

Umino, Masahide; Tamura, Eijiro; Karasuno, Isamu; Ichidate, Minoru; and Kubo, Toshihiko, to Sumitomo Metal Industries, Ltd. Oil-atomized low-alloy steel powder. 4,437,891, Cl. 75-251.000.

Unden, Nils H. Air flow direction indicator. 4,437,425, Cl. 114-102.000.

Union Carbide Corporation: *See*—
Ayad, Hafez M., 4,438,110, Cl. 424-217.000.
Duroyon, Herve, 4,437,209, Cl. 17-49.000.
Kampe, Dennis J.; and Sarangapani, Srinivasan, 4,438,216, Cl. 502-101.000.
Scott, Robert J., 4,438,014, Cl. 252-174.210.
Zupancic, Ronald L., 4,437,231, Cl. 29-623.200.

Union Oil Company of California: *See*—
Hawryluk, Raymond; Johnson, Clyde R.; and Masarky, N. Henri, 4,437,884, Cl. 75-7.000.

Union Siderurgique du Nord et de l'Est de la France: *See*—
Cordier, Jean; and Rollot, Pierre, 4,437,651, Cl. 266-193.000.

Uniroyal, Inc.: *See*—
Bell, Allyn R.; Doweyko, Arthur M. P.; and Minatelli, John A., 4,438,271, Cl. 546-294.000.
Hunter, Byron A., 4,438,223, Cl. 521-92.000.
Wefer, John M., 4,438,171, Cl. 428-215.000.

United Chemi-Con, Inc.: *See*—
Phillips, Jeffrey; and Takei, Hiroshi, 4,438,481, Cl. 361-433.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See*—
White, Robert A.; and Yell, Ralph W., 4,438,503, Cl. 364-721.000.

U. S. Industries, Inc.: *See*—
Nijhof, W. A. J., 4,437,433, Cl. 119-18.000.

United States of America
Air Force: *See*—
Anderson, Harold R.; and Hamilton, Roland M., 4,437,544, Cl. 182-120.000.
Kelly, Richard H., 4,437,748, Cl. 354-132.000.
MacFarland, James M.; and Kappe, Bernard W., 4,437,710, Cl. 312-1.000.
McClenahan, Charles R., 4,438,395, Cl. 324-127.000.
Papazian, Harold A., 4,438,182, Cl. 429-91.000.
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,438,006, Cl. 252-49.900.
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,438,007, Cl. 252-49.900.
Army: *See*—
Petito, Ferdinand C.; and Klauber, Gerald, 4,437,844, Cl. 445-5.000.
Shreve, James S., 4,438,439, Cl. 343-449.000.
Energy: *See*—
Baughman, Richard J.; and Ginley, David S., 4,438,183, Cl. 429-111.000.
Coates, Cameron W.; and Wilson, Thomas J., 4,437,956, Cl. 204-129.350.
Ekdahl, Carl A., 4,438,394, Cl. 324-126.000.
Kerns, Quentin A.; and Miller, Harold W., 4,438,367, Cl. 315-5.410.
Merrigan, Michael A., 4,437,456, Cl. 126-433.000.
Rockwood, Stephen D.; and Sander, Robert K., 4,437,958, Cl. 204-157.10R.
Vuckovich, Michael; Wright, Maynard K.; and Burkett, John P., 4,438,382, Cl. 318-744.000.
Health and Human Services: *See*—
Goldstein, Seth; and Jones, Robert, 4,437,857, Cl. 604-53.000.
Tabor, Edward; and Gerety, Robert J., 4,438,098, Cl. 424-89.000.
Interior: *See*—
Baker, Richard W., 4,437,994, Cl. 210-638.000.
Cawley, James C.; DiMartino, Michael D.; Fisher, Thomas J.; King, Roger L.; and Uhler, Marcus H., 4,438,473, Cl. 361-18.000.
National Aeronautics and Space Administration: *See*—
Banks, Bruce A., 4,437,962, Cl. 204-192.00C.
Routh, Donald E.; and Sharma, Gian C., 4,437,961, Cl. 204-192.0EC.
Waters, William J., 4,437,923, Cl. 156-630.000.
Navy: *See*—
Bobb, Lloyd C.; Rankin, Michael; and Ferguson, Gerald D., 4,438,517, Cl. 372-99.000.
Elias, Luis R.; Madey, John M. J.; and Smith, Todd I., 4,438,513, Cl. 372-2.000.
Martorana, Richard T., 4,437,510, Cl. 165-32.000.
Schwartz, Marcus, 4,437,628, Cl. 244-122.0AG.
Wohltjen, Henry; Sniegoski, Paul J.; and Ravner, Harold, 4,438,203, Cl. 436-60.000.

U.S. Philips Corporation: *See*—
Aldenhoven, Ghislanus M. A. M., 4,437,626, Cl. 242-186.000.
Jatteau, Michel; Lelong, Pierre H.; and Pergrale, Jean, 4,438,334, Cl. 250-363.00S.
Lichtenegger, Siegried, 4,438,332, Cl. 250-310.000.
Muilwijk, Dirk, 4,438,524, Cl. 375-80.000.
Shaffer, Jesse S., 4,437,955, Cl. 204-129.400.
Urner-Willie, Marlies; and Hansen, Peter, 4,438,508, Cl. 365-122.000.
Weber, Wendelin; and Rosenthal, Manfred, 4,437,780, Cl. 400-642.000.

United States Pipe and Foundry Company: *See*—
Battle, Billy J., 4,437,242, Cl. 33-178.00B.
Canada, James W.; and Layton, James W., 4,437,501, Cl. 144-136.00R.

U.S. Product Development Company: *See*—
Adell, Robert, 4,437,916, Cl. 156-222.000.

United Technologies Corporation: *See*—
Chenausky, Peter P.; Newman, Leon A.; and Drinkwater, Erroll H., 4,438,514, Cl. 372-64.000.
Goodman, Robert B., 4,437,485, Cl. 137-220.000.

Unitika Ltd.: *See*—
Miwa, Naoto; and Nakajima, Hiroshi, 4,438,199, Cl. 435-190.000.

University of California, The Regents of the: *See*—
Deftos, Leonard J.; and Catherwood, Bayard D., 4,438,208, Cl. 436-542.000.
Golde, David W.; and Quan, Shirley G., 4,438,032, Cl. 260-112.00R.

University of Missouri, The Curators of the: *See*—
Liu, Henry; Gibson, Donald L.; Cheng, David H. S.; and Rathke, James E., 4,437,799, Cl. 406-198.000.

University of Surrey: *See*—
Zonsveld, Johannes J., 4,437,495, Cl. 138-144.000.

UOP Inc.: *See*—
Imai, Tamotsu, 4,438,287, Cl. 568-909.000.
Imai, Tamotsu; and Hung, Chi-Wen, 4,438,288, Cl. 585-379.000.
Vickers, Anthony G.; and Lomas, David A., 4,438,071, Cl. 422-109.000.

Upjohn Company, The: *See*—
Gammill, Ronald B., 4,438,274, Cl. 549-387.000.
Kaplan, Lester J., 4,438,130, Cl. 424-274.000.

Upravlenie Sanitarno-Tekhnicheskikh Rabot: *See*—
Tigane, Rein K., 4,437,823, Cl. 418-219.000.

Upsher, Michael S. Laryngoscope. 4,437,458, Cl. 128-11.000.

Urabe, Sumio, to Toyo Umpanki Co., Ltd. Electrical power steering system. 4,437,531, Cl. 180-79.100.

Urban Systems Streetscape, Inc.: *See*—
Winden, Joseph, 4,438,484, Cl. 362-267.000.

Urner-Willie, Marlies; and Hansen, Peter, to U.S. Philips Corporation. Magneto-optical memory element. 4,438,508, Cl. 365-122.000.

USM Corporation: *See*—
Kulik, Alphonse C., 4,437,198, Cl. 12-145.000.

Usuda, Koji, to Hitachi, Ltd. Field effect semiconductor device having a protective diode with reduced internal resistance. 4,438,449, Cl. 357-41.000.

Uzunoglu, Vasil, to Communications Satellite Corporation. Phase canceller for carrier recovery network. 4,438,355, Cl. 307-511.000.

Vaidya, Sheila: *See*—
Sheng, Tan T.; Sinha, Ashok K.; and Vaidya, Sheila, 4,438,450, Cl. 357-68.000.

Valencia, Jose. Book index markers. 4,437,685, Cl. 281-42.000.

Valeron Corporation, The: *See—*
Juengel, Richard O.; Begin, John D.; and Khalaf, John, 4,437,240, Cl. 33-172.00E.

Valibouse, Bernard, to Societe Anonyme dite: Alsthom-Atlantique. Apparatus for collecting substances floating on an expanse of liquid. 4,437,989, Cl. 210-242.300.

Valli, Alberto. Peritoneal catheter device for dialysis. 4,437,856, Cl. 604-29.000.

Van F. Belknap Co.: *See—*
Thorn, E. R.; and Thorn, Brent, 4,437,648, Cl. 254-93.00R.

Van Ceulen, Alain: *See—*
Dreulle, Noel; Van Ceulen, Alain; and Eusebe, Claude, 4,437,965, Cl. 204-290.00F.

van Dedem, Gijsbert W. K.: *See—*
Sanders, Adrianus L. M.; Meuleman, Dirk G.; Moelker, Huibert C. T.; van Dedem, Gijsbert W. K.; and van Houdenhoven, Francois E. A., 4,438,108, Cl. 424-183.000.

Vandenbossche, Claudine: *See—*
Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,438,140, Cl. 424-61.000.

Van Der Meulen, Leonard. Arrangement for perforating or cutting foils. 4,437,373, Cl. 83-346.000.

van der Ploeg, Dirk C. H.; and Tameris, Hendrikus M., to Albany International Plastic B.V. Plastic cheese mold. 4,437,787, Cl. 425-84.000.

Van der Velden, Jan H., to Easnil, B.V.; and Hoeke Engineering, N.V. Method of making a ceramic article and articles made by the method. 4,438,055, Cl. 264-44.000.

van der Zel, Joseph M.; and de Groot, Klaas, to Delphi Dental Industries B.V. Implant of ceramic material. 4,437,191, Cl. 3-1.000.

Vanghelauwe, Jozef: *See—*
Bijttebier, Gaspar A. H.; and Vanghelauwe, Jozef, 4,437,655, Cl. 271-3.100.

van Houdenhoven, Francois E. A.: *See—*
Sanders, Adrianus L. M.; Meuleman, Dirk G.; Moelker, Huibert C. T.; van Dedem, Gijsbert W. K.; and van Houdenhoven, Francois E. A., 4,438,108, Cl. 424-183.000.

van Linden, Jan H. L., to Aluminum Company of America. Briquette melting apparatus. 4,437,650, Cl. 266-144.000.

VanSickle, Eugene R. Coil adapter reel. 4,437,625, Cl. 242-129.000.

Van Zeeland, Anthony J., to Oak Industries Inc. Movable member membrane switch. 4,438,301, Cl. 200-16.00C.

Varco International, Inc.: *See—*
Boyadjieff, George I.; and Campbell, Andrew B., 4,437,515, Cl. 166-77.000.
Boyadjieff, George I.; and Picard, Joseph A. R., 4,437,524, Cl. 173-43.000.

Varghese, Philip: *See—*
Derbyshire, Francis J.; and Varghese, Philip, 4,437,972, Cl. 208-8.0LE.

Varian Associates, Inc.: *See—*
Abu-Shumays, Ahmad; Helmer, John C.; and Luchetti, Stephen J., 4,437,812, Cl. 417-53.000.
Patt, Steven L., 4,438,400, Cl. 324-312.000.

Varnovitsky, Marlen, to General Electric Company. Variable slip controller for an AC motor. 4,438,376, Cl. 318-78.000.

Vaseen, Vesper A.: *See—*
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,437,520, Cl. 166-261.000.

Vasiichenko, Dmitry V.: *See—*
Lipatova, Tatyana E.; Vasiichenko, Dmitry V.; Pkhakadze, Georgy A.; and Konoplitskaya, Xenya L., 4,438,249, Cl. 528-61.000.

Vatja, Aulis, to Lonnstrom Oy. Conveyor chain. 4,437,565, Cl. 198-851.000.

VDO Adolf Schindling AG: *See—*
Stier, Bernhard, 4,438,423, Cl. 340-52.00R.

Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Storr, Rudolf, 4,437,600, Cl. 226-108.000.

Veda, Inc.: *See—*
Buschbom, Floyd E.; and Hansen, Glen D., 4,437,637, Cl. 248-163.00A.

VerBerkmoes, John A.: *See—*
Plattner, Robert F.; Arend, Raymond J.; and VerBerkmoes, John A., 4,437,396, Cl. 99-475.000.

Verboom, Pieter, to IHC Holland N.V. Method for sucking up soil or sludge by means of a suction hopper dredge as well as a suction dredge for applying the method. 4,437,244, Cl. 37-63.000.

Vereinigte Aluminum-Werke AG: *See—*
Pietsch, Hartmut; Turke, Wolfgang; Bareuther, Ernst; Kampf, Fritz; and Bings, Hubert, 4,438,076, Cl. 423-30.000.

Vereinigte Flugtechnische Werke Fokker GmbH: *See—*
Martens, Wilhelm; and Dilmaghani, Homayoun, 4,437,631, Cl. 244-214.000.

Verhagen, Laurentius A. M.; and Bodor, Janos, to Lever Brothers Company. Spreadable water-in-oil emulsion based on a high-melting butterfat fraction and a liquid oil. 4,438,149, Cl. 426-603.000.

Vermijs, Winfried J. W.: *See—*
Willems, Michael H.; and Vermijs, Winfried J. W., 4,438,083, Cl. 423-266.000.

Verrinder, Robert F.: *See—*
Sekel, Stephen M.; Strange, Rodney G.; and Verrinder, Robert F., 4,438,498, Cl. 364-483.000.

Versuchsanstalt f. Deutsche Forschungs-u Luft-u Raumfahrt e.V: *See—*
Ackermann, Ulrich; and Ratsch, Eggo, 4,438,316, Cl. 219-121.0PC.

Vespasiani, Alberto, to Societa' Pneumatici Pirelli S.p.A. Apparatus for producing metallic cords in layers. 4,437,297, Cl. 57-9.000.

Vickers, Anthony G.; and Lomas, David A., to UOP Inc. Fluid catalyst regeneration apparatus. 4,438,071, Cl. 422-109.000.

Victory Equipment Limited: *See—*
Erdman, Victor B., 4,437,296, Cl. 56-400.000.

Vignon, Louis, to Heberlein Hispano SA. Device for the continuous spinning of textile yarns. 4,437,300, Cl. 57-74.000.

Vilenski, Dan: *See—*
Razon, Ely; and Vilenski, Dan, 4,437,604, Cl. 228-179.000.

Vinegar, Ralph, to Burroughs Wellcome Co. Pharmaceutical combination. 4,438,142, Cl. 424-260.000.

Vivar, Incorporated: *See—*
Hovsepians, Vigen M., 4,437,704, Cl. 297-440.000.

VLSI Technology Research Association: *See—*
Toyoda, Hiroyasu; Komiya, Hiroyoshi; and Itakura, Hideaki, 4,438,315, Cl. 219-121.0PE.

Vogel, Alfredo, to Cosworth Research and Development Limited. Method of and apparatus for treating granular material. 4,437,834, Cl. 432-14.000.

Voigt, William C. Efficiency switching-mode power supply. 4,438,485, Cl. 363-21.000.

Volk, Kurt E., Jr.; Herbert, Everett H.; and Stenner, John W., to Kurt H. Volk, Inc. Method of producing mailer with self contained reply envelope. 4,437,852, Cl. 493-216.000.

Volka, Lubomir J., to Burroughs Corporation. Flat ribbon cable shield. 4,437,724, Cl. 339-143.00R.

Volkswagenwerk AG: *See—*
Hofbauer, Peter, 4,437,443, Cl. 123-446.000.

Volland, Michel F.: *See—*
Deborde, Albert H.; and Volland, Michel F., 4,437,352, Cl. 73-862.470.

Volna, William M. Spindle squaring tool. 4,437,803, Cl. 409-218.000.

Von Duprin, Inc.: *See—*
Godec, Maksimilijan, 4,437,693, Cl. 292-191.000.

von Branchel, Helmut; Schreiber, Georg; and Schroeder, Heinz, to Dynamit Nobel Aktiengesellschaft. Process and apparatus for the production and maintenance of a fluidized layer in heterogeneous systems. 4,438,075, Cl. 422-189.000.

Vondrovsky, Gabriel: *See—*
Ehgartner, Gabriele; and Vondrovsky, Gabriel, 4,437,749, Cl. 354-214.000.

von Schuckmann, Alfred, to Colgate-Palmolive Company. Dispenser for, in particular, pasty substances. 4,437,591, Cl. 222-391.000.

Vorwerk & Co. Interholding GmbH: *See—*
Guhne, Wieland, 4,437,204, Cl. 15-325.000.
Wulf, Peter; and Schlecht, Annegret, 4,437,199, Cl. 15-49.00R.

Voser, Othmar, to Kupferdraht-Isolierwerk AG Wildegg. Cable with impregnated fiber strength member for non-slip clamping. 4,438,293, Cl. 174-79.000.

Vought Corporation: *See—*
Fling, George K., 4,437,674, Cl. 277-188.00A.

Vuckovich, Michael; Wright, Maynard K.; and Burkett, John P., to United States of America, Energy. Three phase AC motor controller. 4,438,382, Cl. 318-744.000.

W. R. Grace & Co., Cryovac Div.: *See—*
Sanborn, Philip A., Jr., 4,437,293, Cl. 53-412.000.

Wada, Toshiaki: *See—*
Furukawa, Mitsuhiki; Miyahara, Michito; Kitahira, Takashi; Misumi, Kiyohito; Shiroyama, Masaharu; and Wada, Toshiaki, 4,438,213, Cl. 501-92.000.

Wagner, Fritz: *See—*
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Wagner, James B.: *See—*
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Wagner, Karl: *See—*
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Wago Verwaltungsgesellschaft mit beschrankter Haftung: *See—*
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Wagu, Masakatsu; Hayashi, Shoichiro; and Kodama, Kouichi, to Kureha Kagaku Kabushiki Kaisha. Inclusion compound of eicosapentaenoic acid or docosahexaenoic acid with cyclodextrin. 4,438,106, Cl. 424-180.000.

Waits, Charles G.: *See—*
Rog, Joseph W.; Waits, Charles G.; and Nicholas, Karl W., 4,438,391, Cl. 324-71.100.

Walbrohl, Heinz T. Method and apparatus for the advancing of a sliding form. 4,437,788, Cl. 405-146.000.

Walkowiak, Michael: *See—*
Schmitz-Josten, Robert; Suling, Carlhans; Podszun, Wolfgang; Bomer, Bruno; Borgardt, Manfred; and Walkowiak, Michael, 4,437,836, Cl. 433-199.000.

Wallace, Gearld F.: *See—*
O'Hanlon, Tom A.; Madonna, Peter L.; and Wallace, Gearld F., 4,437,525, Cl. 175-218.000.

Wallis, Christopher J.: *See—*
Collington, Eric W.; Hallett, Peter; and Wallis, Christopher J., 4,438,111, Cl. 424-246.000.
Collington, Eric W.; Hallett, Peter; Wallis, Christopher J.; and Bradshaw, John, 4,438,112, Cl. 424-244.000.

Walter, Lothar: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Horling, Peter; Hetterich, Hermann; and Kunkel, Heinrich, 4,437,214, Cl. 29-149.5DP.

Wang, Tsing-Chow: *See*—
Flannery, William E.; Josephs, Richard M.; Stein, Barry F.; Wang, Tsing-Chow; and Young, Peter L., 4,437,227, Cl. 29-589.000.

Warner-Lambert Company: *See*—
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Warner & Swasey Company, The: *See*—
Koenig, C. Fred, III, 4,437,675, Cl. 279-1.00C.

Wason, Thomas D., to Cain Encoder Company. Self-sequencing data bus allocation system. 4,438,434, Cl. 340-825.510.

Wasson, George E., to Conoco Inc. Separation of clay from coal. 4,437,982, Cl. 209-5.000.

Watanabe, Isamu; Yamaguchi, Takashi; Kamiya, Kazuhiro; Mori, Toshihito; Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, to Kowa Company, Ltd.; and Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Aminoglycosides and use thereof. 4,438,107, Cl. 424-180.000.

Watanabe, Syoji: *See*—
Saito, Yukio; Nogita, Shunsuke; Watanabe, Syoji; and Baba, Kenji, 4,437,992, Cl. 210-603.000.

Watanabe, Takao: *See*—
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Watanabe, Takeshi: *See*—
Sudo, Ryoichi; Shoji, Fusaji; Watanabe, Takeshi; Suzuki, Kenkichi; and Ooue, Michio, 4,437,731, Cl. 350-340.000.

Watanabe, Yoshio; Yamane, Mikiya; and Tomura, Teruichi, to Hitachi, Ltd. Low pressure metal vapor discharge lamp. 4,438,373, Cl. 315-334.000.

Waters, William J., to United States of America, National Aeronautics and Space Administration. Multicolor printing plate joining. 4,437,923, Cl. 156-630.000.

Weatherston, Roger C. Oil-free rotary compressor. 4,437,818, Cl. 418-9.000.

Weaver, John D., to Dow Chemical Company, The. Preparation of antimony trifluorodichloride and fluorination of fluorinatable hydrocarbons and halocarbons therewith. 4,438,088, Cl. 423-466.000.

Webber, John R.: *See*—
Rica, Albert F.; Hay, Lloyd F.; Heron, John R.; Webber, John R.; and Rechtsteiner, Steven A., 4,437,315, Cl. 62-63.000.

Weber, Harold J. Antilatchup pseudorandom binary sequence generator. 4,438,501, Cl. 364-717.000.

Weber, Hermann, to Techsight Corporation. Coating process. 4,438,159, Cl. 427-162.000.

Weber, Richard A.; and Schutz, Carl-Heinz, to Thyssen Aktiengesellschaft Vorm.August Thyssen-Hutte. Vessel for the treatment of molten metal. 4,437,652, Cl. 266-275.000.

Weber, Wendelin; and Rosenthal, Manfred, to U.S. Philips Corporation. Cylindrical platen printer with improved paper guide. 4,437,780, Cl. 400-642.000.

Webster Air Equipment Ltd.: *See*—
Demers, Robert J.; and Schilbe, Rick, 4,437,490, Cl. 137-512.400.

Weder, Hans G.; Zumbuhl, Otmar; Schwendener, Reto; and Milsmann, Manfred, to Weder, Hans Georg. Process and device for producing bilayer vesicles. 4,438,052, Cl. 264-4.600.

Weder, Hans Georg: *See*—
Weder, Hans G.; Zumbuhl, Otmar; Schwendener, Reto; and Milsmann, Manfred, 4,438,052, Cl. 264-4.600.

Weeks, Vaughan B.: *See*—
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Wefer, John M., to Uniroyal, Inc. Coextruded product of AES-thermoplastic graft copolymer. 4,438,171, Cl. 428-215.000.

Weglin, Walter, to Jerobee Industries, Inc. Method of making fine-line die. 4,437,924, Cl. 156-651.000.

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Weihe, Georg: *See*—
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Weihe, Rolf; and Weihe, Georg, to Siplast Siegerlander GmbH. Ring binder. 4,437,781, Cl. 402-8.000.

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Wells, Alfred E., Jr.; and Casillo, James H., to Thermo Electric Co., Inc. Fast response thermocouple surface probe. 4,438,290, Cl. 136-221.000.

Wells, Hugh A.: *See*—
Tucker, John G.; and Wells, Hugh A., 4,437,605, Cl. 228-180.00R.

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Werner, Peter: *See*—
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Western Electric Company, Inc.: *See*—
Bitler, Joel R.; Bodnar, Michael W.; Booth, Raymond H.; Roman, Daniel J.; Schneider, Fred J.; Seitzer, Philip W.; and Wilkinson, George F., Jr., 4,437,229, Cl. 29-593.000.
Hurst, Jerry C., 4,437,362, Cl. 81-43.000.
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Westinghouse Electric Corp.: *See*—
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Deis, Daniel W.; and Kemeny, George A., 4,437,383, Cl. 89-8.000.
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Haley, Paul H., 4,438,475, Cl. 361-82.000.
Hruda, Robert M., 4,438,302, Cl. 200-17.00R.
Paice, Derek A., 4,438,474, Cl. 361-58.000.

Weston, David. Production of aluminum metal from alumina bauxites and clays by firstly producing a purified aluminum monochloride. 4,437,887, Cl. 75-68.00B.

Weyl, Helmut: *See*—
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Whang, Kyu B., to International Monopoly Association. Water-proof briquette and method for production thereof. 4,437,862, Cl. 44-6.000.

Whewell, Bruce R. Polyester antistatic laminate materials. 4,438,174, Cl. 428-247.000.

Whirlpool Corporation: *See*—
Koland, David G., 4,437,205, Cl. 15-354.000.

White, Claude C., to Birmingham Bolt Company. Mine roof anchor assembly. 4,437,795, Cl. 405-259.000.

White Consolidated Industries, Inc.: *See*—
Zalewski, Gerald F., 4,437,201, Cl. 15-316.00R.

White, David L., to Medtronic, Inc. Transvenous cardiovascular integrated lead anchoring sleeve, protector, and permanent lead introducer stop gap. 4,437,475, Cl. 128-785.000.

White, Robert A.; and Yell, Ralph W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Waveform synthesizers. 4,438,503, Cl. 364-721.000.

Whitehouse, Craig M.; Cox, Nigel; Burt, Allan G.; and Snyder, Daniel R., to DRS Infusion Systems, Inc. Hydraulic syringe drive. 4,437,859, Cl. 604-131.000.

Whitehurst, Brooks M.; and Clemens, Donald F. Peat fuel slurry. 4,437,863, Cl. 44-51.000.

Whiteman, Patrick W., to Recycled Paper Bedding, Inc. Process for preparing animal bedding. 4,437,615, Cl. 241-24.000.

Wick, Wilhelm: *See*—
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Wicnienski, Michael F., to Baxter Travenol Laboratories, Inc. Level sensitive reset circuit for digital logic. 4,438,357, Cl. 307-597.000.

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Wiczer, Max; and Peters, Albin, 4,437,664, Cl. 273-121.00A.

Wiczer, Max; and Peters, Albin, to Wico Corporation. Pin ball game with oscillating shooter. 4,437,664, Cl. 273-121.00A.

Wiebesick, Wilhelm, to Herbert Kannegiesser GmbH & Co. Apparatus for feeding laundry to an ironing machine. 4,437,247, Cl. 38-143.000.

Wiedemann, Fritz; Kampe, Wolfgang; [illegible] Karl; and Sponer, Gisbert, to Boehringer Mannheim GmbH. Chloroactive aryloxypropanolamines. 4,438,128, Cl. 424-[illegible]

Wiedemann, Gunter: *See*—
Banke, Karl-Heinz; Hering, [illegible]; Dieter; Wiedemann, Gunter; [illegible] 4,438,053, Cl. 264-25.000.

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Wiersma, Jack G.: *See*—
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Willems, Michael H.; and Vermijs, Winfried J. W., to Stamicarbon B.V. Process for preparing magnesium nitrate hexahydrate and for thermally stabilizing ammonium nitrate using magnesium nitrate hexahydrate. 4,438,083, Cl. 423-266.000.

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Fracalossi, Roland N.; Greenhouse, Walter V. V.; and Buchanan, Michael S., 4,438,221, Cl. 521-55.000.

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Williams, David M.: *See*—
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Willis, Arthur B., deceased: *See*—
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Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; Fozo, Steven R.; and Kern, Glenn A., to Ford Motor Company. Adaptive strategy to control internal combustion engine. 4,438,497, Cl. 364-431.050.
Wilmers, Gottlieb, to Audi NSU Auto Union Aktiengesellschaft. Electrically operable valve. 4,437,644, Cl. 251-11.000.
Wilson, David A.: *See*—
Svatek, Katherine H.; Wilson, David A.; and Griffin, Freddie, Jr., 4,438,040, Cl. 260-439.00R.
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Wilson, Norman H.: *See*—
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Wilson, Robert F., deceased: *See*—
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Wilson Trailer Co.: *See*—
Lewis, Mack A.; and Spencer, Mike R., 4,437,699, Cl. 296-181.000.
Wilt, Mason S., to Phillips Petroleum Company. Continuous polymerization reactor. 4,438,074, Cl. 422-135.000.
Winchell, Frank J.; and Winkelmann, Klaus O., to General Motors Corporation. Three-track motorcycle with cambering main frame. 4,437,535, Cl. 180-215.000.
Winden, Joseph, to Urban Systems Streetscape, Inc. Lighting bollard for use in an urban environment. 4,438,484, Cl. 362-267.000.
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Wirz, Burkhardt; and Preuss, Alfred, to Grapho Metronic Mess- und Regeltechnik GmbH & Co. KG. Device for controlling the clamping of printing plates in correct register on the plate cylinder of an offset printing machine. 4,437,407, Cl. 101-409.000.
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Wissinger, John W. Cabinet system. 4,437,712, Cl. 312-246.000.
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Withers, Michael S., 4,437,952, Cl. 204-[illegible].
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Wittenberg, Helmut, and Hegenscheidt, Valentin, to Wilhelm Hegenscheidt Gesellschaft mbH. Cambered sleeve or smooth rolling machine. 4,437,318, Cl. 72-110.000.
Woebcke, Herman N.; Bhojwani, Arju H.; and Gartside, Robert J., to Stone & Webster Engineering Corp. Solids quench boiler and process. 4,437,979, Cl. 208-153.000.
Wohltjen, Henry; Sniegoski, Paul J.; and Ravner, Harold, to United States of America, Navy. Method and apparatus for determination of lubricant stability. 4,438,203, Cl. 436-60.000.
Wojnarowski, Robert J.: *See*—
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Wolf, Sten J. L.: *See*—
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Wong, Kwee C., to Dart Industries Inc. Dissolution of metals utilizing a lactone. 4,437,927, Cl. 156-666.000.
Wong, Kwee C., to Dart Industries Inc. Dissolution of metals utilizing a glycol ether. 4,437,928, Cl. 156-666.000.
Wong, Kwee C., to Dart Industries Inc. Dissolution of metals utilizing pyrrolidone. 4,437,929, Cl. 156-666.000.
Wong, Kwee C., to Dart Industries Inc. Dissolution of metals utilizing ϵ-caprolactam. 4,437,930, Cl. 156-666.000.
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Woodall, James C., to Mark Products, Inc. Waterproof housing assembly for geophones. 4,438,292, Cl. 174-52.00R.
Woodard, Thomas R.; and Martin, Kenneth L., to Texas Instruments Incorporated. Thermal printing apparatus having a thermal printhead substrate with special geometry for bi-directional printing. 4,438,320, Cl. 219-216.000.
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Yamaguchi, Hiroshi, to Nissan Motor Company, Limited. Automotive vehicle engine control system. 4,437,442, Cl. 123-417.000.
Yamaguchi, Kunio: *See*—
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Yamaguchi, Taturo; and Minemura, Norihiro, to Teijin Limited. Process for durably modifying a shaped synthetic polymer article. 4,438,151, Cl. 427-36.000.
Yamaguchi, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Musical envelope-producing device. 4,437,380, Cl. 84-1.260.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamamoto, Hideharu; and Tsuneno, Hiroshi, to Hitachi, Ltd. Method of mounting a silicon pellet on a ceramic substrate. 4,437,228, Cl. 29-590.000.

Yamamoto, Kazuaki: *See*—
Sato, Hiroyasu; Yamamoto, Kazuaki; and Aotsu, Hiroaki, 4,438,385, Cl. 322-28.000.

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Yamaoka, Nobutatsu: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,438,214, Cl. 501-136.000.

Yamashita, Kiyofumi; and Kodama, Toshikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Filter circuit utilizing a surface acoustic wave filter. 4,438,417, Cl. 333-193.000.

Yamato Scale Company, Ltd.: *See*—
Hasegawa, Eiichi; and Yamano, Shoji, 4,437,561, Cl. 198-504.000.
Omae, Michinobu; and Hirano, Takashi, 4,437,527, Cl. 177-25.000.

Yamazaki, Tamotsu: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Yamazaki, Tamotsu; Nabata, Hiroyuki; Sakai, Kazushige; and Hata, Shun-ichi, 4,438,115, Cl. 424-250.000.

Yamazawa, Masayuki, to Aisin Seiki Kabushiki Kaisha. Thread trimming device for a sewing machine. 4,437,423, Cl. 112-292.000.

Yanaga, Yukio: *See*—
Ohta, Takayuki; Yanaga, Yukio; and Hino, Seiichi, 4,438,256, Cl. 528-188.000.

Yanagisawa, Kazuhisa: *See*—
Sato, Eiichi; Shimizu, Akira; and Yanagisawa, Kazuhisa, 4,438,186, Cl. 430-53.000.

Yanagiuchi, Shigenobu; and Saizi, Mituhiro, to Sharp Kabushiki Kaisha. Electronic dictionary and language interpreter with auto-search key for deriving a full-length word and its associated translation word based on a partial word entered. 4,438,505, Cl. 364-900.000.

Yasuhara, Seishi, to Nissan Motor Company Ltd. Fuel injection pump for a diesel engine. 4,437,444, Cl. 123-458.000.

Yasui, Masaru: *See*—
Kato, Kazuhisa; and Yasui, Masaru, 4,438,154, Cl. 427-39.000.

Yasui, Toshio, to Nippondenso Co., Ltd. Electric apparatus for a vehicle safety device. 4,438,424, Cl. 340-52.00H.

Yazawa, Nobuharu; and Sakaguchi, Yasunori, to Nippon Gijutsu Boeki Co., Ltd. Frequency discriminating device. 4,438,405, Cl. 328-152.000.

Yeager, Raymond W.; and Weitzman, Mark R., to Owens-Corning Fiberglas Corporation. Acoustical wall panel and mounting system. 4,437,542, Cl. 181-290.000.

Yeda Research & Development Co. Ltd.: *See*—
Nir, Aharon; Amiel, Abraham J.; and Krant, Jonathan M., 4,437,263, Cl. 47-1.00R.

Yell, Ralph W.: *See*—
White, Robert A.; and Yell, Ralph W., 4,438,503, Cl. 364-721.000.

Yen, Richard C. K.: *See*—
Rembaum, Alan; and Yen, Richard C. K., 4,438,239, Cl. 525-54.100.

Yeoman, David R. Apparatus for electrolyzing water. 4,437,963, Cl. 204-229.000.

Yerushalmi, Yaakov. Bomb disposal device. 4,437,382, Cl. 86-1.00B.

Yoder, Donald: *See*—
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.

Yoder, Henry Frank, III: *See*—
Headley, James E. R.; Limburg, William R.; Nordmeyer, Robert A.; and Smith, Jay, III, 4,437,738, Cl. 353-26.00R.

Yokogawa Hokushin Electric Corporation: *See*—
Tamura, Hisashi; Ito, Ichizo; Hirayama, Masashi; and Ando, Tetsuo, 4,437,350, Cl. 73-861.240.

Yokota Co., Ltd.: *See*—
Ogita, Koichi, 4,437,506, Cl. 160-331.000.

Yokoyama, Masao; Kon, Masaharu; and Ota, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Outrigger for use in wheel-type vehicle. 4,437,682, Cl. 280-764.100.

Yoneda, Ko: *See*—
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Goto, Hirokazu; and Abiko, Shuzo, 4,438,470, Cl. 360-113.000.

Yonehara, Sadao: *See*—
Kubo, Toshihiko; Ichidate, Minoru; Kawai, Toshiyuki; Yonehara, Sadao; Koiwai, Yoshihisa; and Endo, Kazuhiko, 4,437,883, Cl. 75-0.50C.

Yong, Raymond N., to Suncor, Inc. Method for treating oil sands extraction plant tailings. 4,437,998, Cl. 210-728.000.

York, Billie M., Jr., to Alcon Laboratories, Inc. Spiro-(fluoren-9,4'-imidazolidine)-2',5'-diones. 4,438,272, Cl. 548-308.000.

Yoshida, Akio: *See*—
Moriya, Shigeru; Yoshida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Tsuge, Hiroshi, 4,437,683, Cl. 280-804.000.
Moriya, Shigeru; Yoshida, Akio; Matsunami, Muneharu; Kubota, Tatsushi; Tsuge, Hiroshi; and Nishimura, Yuji, 4,437,684, Cl. 280-804.000.

Yoshida Kogeisha: *See*—
Yoshida, Takashi, 4,437,260, Cl. 46-1.00R.

Yoshida Kogyo K. K.: *See*—
Yoshieda, Keiichi; and Iimura, Yoshitaka, 4,437,233, Cl. 29-768.000.

Yoshida Kogyo K.K.: *See*—
Fukuroi, Takeo, 4,437,210, Cl. 24-435.000.

Yoshida, Ryo: *See*—
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,437,877, Cl. 71-90.000.
Takahashi, Junya; Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; Katoh, Haruhiko; and Sumida, Seizo, 4,437,880, Cl. 71-120.000.

Yoshida, Shuzo: *See*—
Takahashi, Hiroshi; Suzuki, Yukio; Matsuo, Masashi; Ono, Hironobu; Yoshida, Shuzo; Ueda, Kazuo; and Sueishi, Motoharu, 4,437,445, Cl. 123-491.000.

Yoshida, Takashi, to Yoshida Kogeisha. Domino toppling toy. 4,437,260, Cl. 46-1.00R.

Yoshieda, Keiichi; and Iimura, Yoshitaka, to Yoshida Kogyo K. K. Fastener slider holding device. 4,437,233, Cl. 29-768.000.

Yoshihiro, Mitsugu: *See*—
Sakai, Masaaki; and Yoshihiro, Mitsugu, 4,438,377, Cl. 318-254.000.

Yoshikawa, Mamoru: *See*—
Kubo, Kunimichi; Miyazaki, Yasunosuke; Yoshikawa, Mamoru; and Miyoshi, Mituji, 4,438,073, Cl. 422-135.000.

Yoshiki, Yasuo: *See*—
Nishikori, Tsutomu; and Yoshiki, Yasuo, 4,437,703, Cl. 297-362.000.

Yoshinaka, Tadaaki, to Sony Corporation. Time base corrector. 4,438,456, Cl. 358-148.000.

Yoshioka, Akiteru: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,438,113, Cl. 424-246.000.

Young, Alfred G.; Slocomb, Leon F., Jr.; and Bugg, Francis V., to Acroseal Window Corporation. Alarm system. 4,438,430, Cl. 340-547.000.

Young, Peter L.: *See*—
Flannery, William E.; Josephs, Richard M.; Stein, Barry F.; Wang, Tsing-Chow; and Young, Peter L., 4,437,227, Cl. 29-589.000.

Young, Rodney C.: *See*—
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Ystral GmbH: *See*—
Seeger, Hans-Peter, 4,437,765, Cl. 366-264.000.

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Schievelbein, Vernon H.; and Zabczuk, Paul, 4,438,002, Cl. 252-8.55D.

Zabotto, Arlette: *See*—
Koulbanis, Constantin; N'Guyen, Quang L.; Zabotto, Arlette; and Plot, Josiane, 4,437,895, Cl. 106-245.000.

Zahnradfabrik Friedrichshafen, AG: *See*—
Merz, Johann, 4,437,819, Cl. 418-26.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Tanaka, Akihiro, 4,438,109, Cl. 424-180.000.
Watanabe, Isamu; Yamaguchi, Takashi; Kamiya, Kazuhiro; Mori, Toshihito; Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,438,107, Cl. 424-180.000.

Zalewski, Gerald F., to White Consolidated Industries, Inc. Soot blower. 4,437,201, Cl. 15-316.00R.

Zaltsman, Efim, to Monarch Wine Co., Inc. Method and apparatus for stoppering modified bottles with a one-piece corking means. 4,437,291, Cl. 53-319.000.

Zaschke, Horst; Schafer, Wolfgang; Deutscher, Hans-Joachim; Demus, Dietrich; and Pelzl, Gerhard. Liquid crystal substances. 4,438,268, Cl. 544-315.000.

Zehner, Burch E.: *See*—
Suh, Kyung W.; Krueger, David C.; and Zehner, Burch E., 4,438,224, Cl. 521-146.000.

Zeigler, Theodore R., to Nomadic Structures, Inc. Collapsible self-supporting structures. 4,437,275, Cl. 52-109.000.

Zeiler, Hans-Joachim: *See*—
Petersen, Uwe; Stadler, Peter; Lockhoff, Oswald; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,438,260, Cl. 536-13.900.

Zengel, Hans-Georg; Kersten, Hilde; and Magerlein, Helmut, to Akzo, N.V. Method for the crosslinking of cathodically depositable coating agents. 4,437,960, Cl. 204-181.00C.

Zenith Radio Corporation: *See*—
Atkinson, Paul J., 4,438,365, Cl. 313-325.000.

Zerpol Corporation: *See*—
Elliott, Robert H., Jr., 4,437,968, Cl. 204-301.000.

Ziegenhorn, Joachim: *See*—
Deeg, Rolf; Schmitt, Urban; and Ziegenhorn, Joachim, 4,438,204, Cl. 436-67.000.

Ziegler, Walter: *See*—
Oeder, Dieter; Ziegler, Walter; Daeuble, Manfred; Dietsche, Wolfram; Hettche, Albert; and Weiss, Stefan, 4,438,008, Cl. 252-56.00R.

Zimmer, Ernst, to Kuka Schweissanlagen & Roboter GmbH. Tool holder for manipulator arm. 4,438,309, Cl. 219-86.700.

Zimmermann, Frank: *See*—
Ehrmann, Oskar; Raschack, Manfred; Gries, Josef; Kretzschmar, Rolf; Lehmann, Hans D.; Friedrich, Ludwig; Wuppermann, Dirk; Zimmermann, Frank; Seitz, Werner; Treiber, Hans J.; Dengel, Ferdinand; Frank, Wolfram; Kurbjuweit, Hans-Georg; and Mueller, Claus D., 4,438,131, Cl. 424-278.000.

Zimmermann, Volker: *See*—
Schaller, Karl H.; and Zimmermann, Volker, 4,438,467, Cl. 360-77.000.

Zincroksid S.p.A.: *See*—
Bruno, Roberto; and Memmi, Massimo, 4,437,944, Cl. 204-27.000.

Zinsser, Rolf: *See*—
Moderlak, Helmut; Koschinek, Gunter; Zinsser, Rolf; Prehler, Richard; and Kretschmann, Bernd, 4,437,827, Cl. 425-378.00S.

Zobel, Siegfried: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; Lermann, Peter; Wagner, Karl; and Zobel, Siegfried, 4,437,751, Cl. 354-214.000.

Zoleski, Benjamin H.; and Sung, Rodney L., to Texaco Inc. Marine diesel engine lubricant of improved spreadability. 4,438,005, Cl. 252-33.400.

Zonsveld, Johannes J., to University of Surrey. Pipes and pipe coatings. 4,437,495, Cl. 138-144.000.

Zuchtriegel, Anton, to Patent-Treuhand Gesellschaft fur elektrische Gluhlampen mbH. Multiple low-pressure discharge lamp operating circuit. 4,438,372, Cl. 315-224.000.

Zumbuhl, Otmar: *See*—
Weder, Hans G.; Zumbuhl, Otmar; Schwendener, Reto; and Milsmann, Manfred, 4,438,052, Cl. 264-4.600.

Zupancic, Ronald L., to Union Carbide Corporation. Method of making an electrochemical cell having a safety vent closure. 4,437,231, Cl. 29-623.200.

Zyo, Hiroshi: *See*—
Murakami, Naoyuki; and Zyo, Hiroshi, 4,437,540, Cl. 181-147.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MARCH, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aldrich, Robert G., to Halomet, Incorporated. Separation of high grade magnetite from fly ash. Re. 31,540, Cl. 209-172.500.

Antonious, Anthony J. Golf glove. Re. 31,538, Cl. 2-161.00A.

Garden State Engine & Equipment Co., Inc.: *See*—
Spalluto, Frank P., Re. 31,539, Cl. 212-160.000.

Halomet, Incorporated: *See*—
Aldrich, Robert G., Re. 31,540, Cl. 209-172.500.

Spalluto, Frank P., to Garden State Engine & Equipment Co., Inc. Remote-control device for a crane. Re. 31,539, Cl. 212-160.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Air-Flo Manufacturing Co., Inc.: *See*—
Musso, Charles S., Jr., B1 4,266,731, Cl. 239-676.000.

Ceel-Co.: *See*—
Helling, Robert W., B1 3,560,287, Cl. 156-218.000.

Del Fabro, Remigio. Stirrup machine. B1 3,991,600, 3-20-84, Cl. 72-203.000.

Gardner, Conrad O. Feedback modulation of exhaust gases in internal combustion engines. B1 3,788,284, 3-20-84, Cl. 123-571.000.

Helling, Robert W., to Ceel-Co. Method and apparatus for protecting insulated pipe. B1 3,560,287, 3-20-84, Cl. 156-218.000.

Kal Kan Foods, Inc.: *See*—
Palmer, Hugh C., B1 3,808,340, Cl. 426-92.000.

Logothetis, Richard. Variable spot stage light. B1 4,338,654, 3-20-84, Cl. 362-268.000.

Musso, Charles S., Jr., to Air-Flo Manufacturing Co., Inc. Dump spreader. B1 4,266,731, 3-20-84, Cl. 239-676.000.

Ohlhausen, Howard G. Method for protecting nonporous substrates and for rendering them water repellent. B1 3,579,540, 3-20-84, Cl. 523-169.000.

Palmer, Hugh C., to Kal Kan Foods, Inc. Meat coated product. B1 3,808,340, 3-20-84, Cl. 426-92.000.

LIST OF DESIGN PATENTEES

A/S Vestfrost: *See*—
Damkjaer, Erling, 273,114, Cl. D15-88.000.

A. W. Faber-Castell: *See*—
Jankewitz, Axel, 273,143, Cl. D28-57.000.
Jankewitz, Axel, 273,144, Cl. D28-57.000.

Adams Hard-Facing Company, Inc.: *See*—
Wetmore, Halsey J., 273,085, Cl. D8-354.000.

American Hospital Supply Corporation: *See*—
Ponsi, Lawrence G., 273,145, Cl. D29-8.000.

Anderson, Franklin R., to Custom Molders, Inc. Vegetable holder. 273,088, 3-20-84, Cl. D8-395.000.

Arcair Company: *See*—
Johnson, David E.; McCall, Kenneth E.; and Coughlin, William J., 273,097, Cl. D12-36.000.

Astra-Syntex Scandinavia Aktiebolag: *See*—
Lunden, Hans-Goran; and Ternerot, Nils-Ake W., 273,093, Cl. D9-389.000.

Automatic Liquid Packaging, Inc.: *See*—
Pagels, Louis T., 273,134, Cl. D24-56.000.

Babic, Thomas E.; and Pepe, Albert M. Urinal. 273,133, 3-20-84, Cl. D24-54.000.

Barnsfather, Gebus: *See*—
Huff, Robert O.; Krome, Edward F., Jr.; and Barnsfather, Gebus, 273,115, Cl. D15-148.000.
Huff, Robert O.; Krome, Edward F., Jr.; and Barnsfather, Gebus, 273,116, Cl. D15-148.000.

Batts, John H.; and Duester, Everett L., to John Thomas Batts, Inc. Sleepwear hanger. 273,072, 3-20-84, Cl. D6-254.000.

Batts, John H.; and Duester, Everett L., to John Thomas Batts, Inc. Sleepwear hanger. 273,073, 3-20-84, Cl. D6-254.000.

BEGHIN-SAY S.A.: *See*—
Minost, Henry, 273,064, Cl. D6-96.000.

Bell, Melvin C. Detent coupled drill bit chuck or the like. 273,077, 3-20-84, Cl. D8-10.000.

Benedict, Mellen-Thomas. Glass cutter. 273,082, 3-20-84, Cl. D8-98.000.

Bodfish, Nigel F., to Gill-Mentor Limited. Handle for a kitchen tool. 273,076, 3-20-84, Cl. D7-395.000.

Boreback, Stig B. Head for a tool for applying and removing cycle tires. 273,078, 3-20-84, Cl. D8-31.000.

Bradberry, Benjamin C. Turning block for glass panels or the like. 273,080, 3-20-84, Cl. D8-71.000.

Brancher, Rodney: *See*—
Welsch, John H.; and Brancher, Rodney, 273,070, Cl. D6-192.000.

Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone instrument. 273,107, 3-20-84, Cl. D14-53.000.

Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone instrument. 273,108, 3-20-84, Cl. D14-53.000.

Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Combined control device and display unit for telephone exchange. 273,109, 3-20-84, Cl. D14-58.000.

Briggs, Sam A. Shampoo support drain. 273,142, 3-20-84, Cl. D28-20.000.

Brinson, Geneva L.: *See*—
Brinson, James, Jr., 273,054, Cl. D2-376.000.

Brinson, James, Jr., to Brinson, Geneva L. Hunting glove. 273,054, 3-20-84, Cl. D2-376.000.

Brown Group Recreational Products, Inc.: *See*—
Ziegler, William H., 273,100, Cl. D12-111.000.

Bustos, Rafael T., to Leggett & Platt, Incorporated. Display booth. 273,065, 3-20-84, Cl. D6-132.000.

Cabco Research Ltd.: *See*—
Cousins, George, 273,104, Cl. D13-24.000.

Canady, Lanny H. Fishing light. 273,139, 3-20-84, Cl. D26-61.000.

Canon Kabushiki Kaisha: *See*—
Hirata, Takashi; Hirose, Kunio; and Katayama, Hirohiko, 273,111, Cl. D14-101.000.
Hirata, Takashi; and Fushimoto, Hideo, 273,118, Cl. D18-7.000.

Chung Mei Metal & Plastic Factory Ltd.: *See*—
Mann, Kittson, 273,140, Cl. D26-93.000.

Clausen, Mery; and Szaroletta, William K., to Clausen, Mery. Stenographic ruler. 273,094, 3-20-84, Cl. D10-71.000.

Cole, Albert, to Thermoforce Limited. Louvre opener. 273,089, 3-20-84, Cl. D8-400.000.

Coleman, Neil F. Unitary water ski rope handle and reel. 273,086, 3-20-84, Cl. D8-358.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Hoshino, Kiyoshi, 273,125, Cl. D21-150.000.

Cooper Inks, Peggy L. Flag. 273,096, 3-20-84, Cl. D11-175.000.

Coughlin, William J.: *See*—
Johnson, David E.; McCall, Kenneth E.; and Coughlin, William J., 273,097, Cl. D12-36.000.
Cousins, George, to Cabco Research Ltd. Electrical plug or socket cover. 273,104, 3-20-84, Cl. D13-24.000.
Craft, John S. Playing surface for a game board. 273,124, 3-20-84, Cl. D21-34.000.
Custom Molders, Inc.: *See*—
Anderson, Franklin R., 273,088, Cl. D8-395.000.
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Batts, John H.; and Duester, Everett L., 273,073, Cl. D6-254.000.
Evans, James G. Shelf unit. 273,067, 3-20-84, Cl. D6-186.000.
F.C.F. Limited: *See*—
Webb, Anthony J., 273,141, Cl. D28-13.000.
Farr, Grace. Vacuum cleaner intake member. 273,146, 3-20-84, Cl. D32-31.000.
Florists' Transworld Delivery Assn.: *See*—
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Fryklund, Gilbert G.: *See*—
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Gannett Co., Inc.: *See*—
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Gatward, Douglas K. Sheet material dispenser. 273,063, 3-20-84, Cl. D6-96.000.
Genaro, Donald M.; and Tilley, Alvin R., to Teletype Corporation. Teleprinter keyboard and telephone. 273,110, 3-20-84, Cl. D14-58.000.
Gill-Mentor Limited: *See*—
Bodfish, Nigel F., 273,076, Cl. D7-395.000.
GKN Kent Alloys Limited: *See*—
Woodward, Richard R., 273,102, Cl. D12-209.000.
Goff, Aldwin K. Rocking chair. 273,061, 3-20-84, Cl. D6-49.000.
Gore, Fred M., to Gannett Co., Inc. Newspaper vending rack or similar article. 273,123, 3-20-84, Cl. D20-6.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Surgical stapler. 273,130, 3-20-84, Cl. D24-26.000.
Hamilton Sorter Co., Inc.: *See*—
Yauger, Jon A., 273,069, Cl. D6-192.000.
Hartman, Kenneth: *See*—
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Hartmann Luggage Company: *See*—
Katz, Ira R.; and Davis, Robert P., 273,057, Cl. D3-71.000.
Hayden, Shawn A. Turning utensil for barbecues. 273,075, 3-20-84, Cl. D7-106.000.
Helmac Products Corporation: *See*—
McKay, Nicholas D., 273,058, Cl. D4-23.100.
McKay, Nicholas D., 273,059, Cl. D4-23.100.
Henkel, Daniel P., to Square D Company. Electrical outlet cover plate and closure therefor. 273,084, 3-20-84, Cl. D8-353.000.
Hirata, Takashi; Hirose, Kunio; and Katayama, Hirohiko, to Canon Kabushiki Kaisha. Combined data input terminal and acoustic coupler. 273,111, 3-20-84, Cl. D14-101.000.
Hirata, Takashi; and Fushimoto, Hideo, to Canon Kabushiki Kaisha. Desk-top electronic calculator. 273,118, 3-20-84, Cl. D18-7.000.
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Huff, Robert O.; Krome, Edward F., Jr.; and Barnsfather, Gebus, to Reliance Electric Company. Variable speed belt drive. 273,116, 3-20-84, Cl. D15-148.000.
HurletronAltair, Inc.: *See*—
Knoll, Russell D., 273,113, Cl. D14-116.000.
Ibaraki, Howard, to Orion Industries, Inc. Buffer. 273,079, 3-20-84, Cl. D8-62.000.
Iijima, Takekazu, to Pioneer Kabushiki Kaisha. Loudspeaker. 273,106, 3-20-84, Cl. D14-30.000.
Imai, Hirotaka, to Pioneer Electronic Corporation. Cassette tape recorder. 273,105, 3-20-84, Cl. D14-6.000.
Imperial, Raymond E. Threshold seal for a door astragal. 273,090, 3-20-84, Cl. D8-400.000.
Ishii, Yoshiyasu: *See*—
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Ito, Katsumi, to Shachihata Industrial Co., Ltd. Stamp. 273,120, 3-20-84, Cl. D18-15.000.
Iverson, Landis. Service stand for automotive service station. 273,147, 3-20-84, Cl. D34-6.000.
Jankewitz, Axel, to A. W. Faber-Castell. Cuticle device. 273,143, 3-20-84, Cl. D28-57.000.
Jankewitz, Axel, to A. W. Faber-Castell. Cuticle device. 273,144, 3-20-84, Cl. D28-57.000.
Jansen, Rudolph A.: *See*—
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Batts, John H.; and Duester, Everett L., 273,072, Cl. D6-254.000.
Batts, John H.; and Duester, Everett L., 273,073, Cl. D6-254.000.
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69 C 4,437,529
75 4,437,530
79.1 4,437,531
142 4,437,532
168 4,437,533
190 4,437,534
215 4,437,535
254 4,437,536
313 4,437,537

CLASS 181

129 4,437,538
145 4,437,539
147 4,437,540
151 4,437,541
290 4,437,542

CLASS 182

2 4,437,543
120 4,437,544
171 4,437,545
233 4,437,546

CLASS 188

1.11 4,437,547
289 4,437,548

CLASS 190

109 4,437,549

CLASS 192

3.28 4,437,551
26 4,437,552
46 4,437,553
58 B 4,437,554
70.21 4,437,555
98 4,437,556
324 4,437,550

CLASS 194

1 D 4,437,557
97 R 4,437,558

CLASS 198

397 4,437,559
457 4,437,560
504 4,437,561
733 4,437,562
810 4,437,563
834 4,437,564
851 4,437,565

CLASS 200

16 C 4,438,301
17 R 4,438,302
51.1 4,438,303
67 D 4,438,304
83 J 4,438,305
144 B 4,438,307
148 A 4,438,308
148 F 4,438,306

CLASS 201

39 4,437,936

CLASS 202

160 4,437,937

CLASS 203

14 4,437,938
4,437,939
49 4,437,940
50 4,437,941

CLASS 204

6 4,437,942
16 4,437,943
27 4,437,944
35 N 4,437,945
4,437,946
35 R 4,437,947
52 R 4,437,948
59 M 4,437,949
67 4,437,950
98 4,437,951
4,437,952
119 4,437,953
129 4,437,954
129.35 4,437,956
129.4 4,437,955
147 4,437,957
157.1 R 4,437,958
159.11 4,437,959
181 C 4,437,960
192 C 4,437,962
192 EC 4,437,961
229 4,437,963
245 4,437,964
290 F 4,437,965
298 4,437,966
301 4,437,967
4,437,968
403 4,437,969
412 4,437,970
427 4,437,971

CLASS 206

1.5 4,437,566
210 4,437,567
223 4,437,568
601 4,437,569
4,437,570

CLASS 208

8 LE 4,437,972
10 4,437,973
4,437,974
87 4,437,975
97 4,437,976
113 4,437,977
120 4,437,978
153 4,437,979
235 4,437,980
253 4,437,981

CLASS 209

5 4,437,982
166 4,437,983
172.5 Re.31,540
211 4,437,984
538 4,437,985
551 4,437,571

CLASS 210

130 4,437,986
137 4,437,987
237 4,437,988
242.3 4,437,989
321.3 4,437,990
413 4,437,991
603 4,437,992
631 4,437,993
638 4,437,994
714 4,437,995
718 4,437,996
727 4,437,997
728 4,437,998
748 4,437,999
786 4,438,000

CLASS 211

86 4,437,572

CLASS 212

160 Re.31,539
263 4,437,573

CLASS 215

247 4,437,574

CLASS 219

10.43 4,438,310
10.49 R 4,438,311
69 W 4,438,312
73.1 4,438,313
86.7 4,438,309
98 4,438,314
121 PC 4,438,316
121 PE 4,438,315
130.51 4,438,317
137 PS 4,438,318
4,438,319
216 4,438,320
4,438,321
236 4,438,322
243 4,438,323
441 4,438,324
536 4,438,325

CLASS 220

1 T 4,437,575
90.4 4,437,576
224 4,437,577
256 4,437,578

CLASS 221

25 4,437,579
75 4,437,580

CLASS 222

54 4,437,581
94 4,437,582
108 4,437,583
137 4,437,584
181 4,437,585
4,437,586
207 4,437,587
321 4,437,588
327 4,437,589
386.5 4,437,590
391 4,437,591
402.12 4,437,592
541 4,437,593
544 4,437,594
642 4,437,595

CLASS 224

39 4,437,596
42.45 R 4,437,597
163 4,437,598
319 4,437,599

CLASS 226

108 4,437,600
199 4,437,601

CLASS 227

147 4,437,602

CLASS 228

4.5 4,437,603
179 4,437,604
180 R 4,437,605

CLASS 229

40 4,437,606

CLASS 232

35 4,437,607

CLASS 235

181 4,438,328
379 4,438,326
462 4,438,327

CLASS 236

13 4,437,608
49 4,437,609

CLASS 239

119 4,437,610
453 4,437,611
556 4,437,612
676 B1 4,266,731
688 4,437,613
691 4,437,614

CLASS 241

24 4,437,615

CLASS 242

7.02 4,437,616
18 EW 4,437,617
71.8 4,437,618
75.51 4,437,619
83 4,437,620
84.1 J 4,437,621
86.5 R 4,437,622
107.2 4,437,623
107.3 4,437,624
129 4,437,625
186 4,437,626

CLASS 244

54 4,437,627
122 AG 4,437,628
122 R 4,437,629
136 4,437,630
214 4,437,631

CLASS 246

34 R 4,437,632

CLASS 248

68 R 4,437,633
97 4,437,634
122 4,437,635
137 4,437,636
163 A 4,437,637
282 4,437,638
558 4,437,639

CLASS 249

20 4,437,640
79 4,437,641
175 4,437,642

CLASS 250

201 4,438,330
211 J 4,438,331
310 4,438,332
327.2 4,438,333
363 S 4,438,334
4,438,335
398 4,438,336
436 4,438,337
459.1 4,438,329
551 4,438,338

CLASS 251

1 A 4,437,643
11 4,437,644
65 4,437,645
145 4,437,646
149.9 4,437,647

CLASS 252

8.55 D 4,438,002
8.7 4,438,001
12 4,438,003
4,438,004
33.4 4,438,005
49.9 4,438,006
4,438,007
51.5 R 4,438,022
56 R 4,438,008
90 4,438,009
91 4,438,010
106 4,438,011
131 4,438,012
146 4,438,013
162 4,438,020
174.21 4,438,014
174.24 4,438,015
174.25 4,438,016
301.17 4,438,017
356 4,438,018
522 R 4,438,023
545 4,438,024
4,438,025
4,438,026
581 4,438,027
609 4,438,028

CLASS 254

93 R 4,437,648

CLASS 260

112 R 4,438,032
112.5 R 4,438,029
4,438,030
4,438,031
239.3 B 4,438,035
239.3 R 4,438,034
239.55 C 4,438,033
245.2 T 4,438,036
385 4,438,037
414 4,438,038
429.5 4,438,039
439 R 4,438,040
464 4,438,041
465 B 4,438,042
465 F 4,438,043
501.12 4,438,044
501.13 4,438,045
501.15 4,438,046
513 R 4,438,047
982 4,438,048

CLASS 261

42 4,438,049

CLASS 264

0.5 4,438,050
1.2 4,438,051
4.6 4,438,052
25 4,438,053
40.6 4,438,054
44 4,438,055
45.2 4,438,056
46.5 4,438,057
51 4,438,058
105 4,438,059
206 4,438,060
249 4,438,061
255 4,438,062
311 4,438,063
328.15 4,438,064
335 4,438,065

CLASS 266

48 4,437,649
144 4,437,650
193 4,437,651
275 4,437,652

CLASS 267

140.1 4,437,653

CLASS 269

283 4,437,654

CLASS 271

3.1 4,437,655
10 4,437,656
100 4,437,657
125 4,437,658
276 4,437,659
290 4,437,660

CLASS 273

55 R 4,437,661
73 D 4,437,662
81.2 4,437,663
121 A 4,437,664
138 R 4,437,665
141 R 4,437,666
153 S 4,437,667
156 4,437,668
185 B 4,437,672
186 C 4,437,669
296 4,437,670
372 4,437,671

CLASS 277

65 4,437,673
188 A 4,437,674

CLASS 279

1 C 4,437,675

CLASS 280

78 4,437,676
234 4,437,677
276 4,437,678
281 R 4,437,679
460 R 4,437,680
733 4,437,681
764.1 4,437,682
804 4,437,683
4,437,684

CLASS 281

42 4,437,685

CLASS 285

12 4,437,686
42 4,437,687
95 4,437,688
246 4,437,689
272 4,437,690
353 4,437,691

CLASS 290

1 R 4,438,339
2 4,438,340
44 4,438,341
45 4,438,342
53 4,438,343

CLASS 292

57 4,437,692
191 4,437,693
235 4,437,694
352 4,437,695

CLASS 293

118 4,437,696
4,437,697

CLASS 296

1 S 4,437,698
181 4,437,699

CLASS 297

45 4,437,700
85 4,437,701
284 4,437,702
362 4,437,703
440 4,437,704

CLASS 298

1 R 4,437,705

CLASS 299

7 4,437,706
81 4,437,707
4,437,708

CLASS 307

146 4,438,344
270 4,438,345
297 4,438,346
308 4,438,347
310 4,438,348
362 4,438,349
440 4,438,350
450 4,438,351
475 4,438,352
477 4,438,353
493 4,438,354
511 4,438,355
571 4,438,356
597 4,438,357

CLASS 308

219 4,437,709

CLASS 310

51 4,438,358
88 R 4,438,359
83 4,438,360
90 4,438,361
152 4,438,362
328 4,438,363
4,438,364

CLASS 312

1 4,437,710
201 4,437,711
246 4,437,712
259 4,437,713
281 4,437,714
348 4,437,715

CLASS 313

325 4,438,365

CLASS 315

1 4,438,366
5.41 4,438,367
39 4,438,368
49 4,438,369
106 4,438,370
111.81 4,438,371
224 4,438,372
334 4,438,373
362 4,438,374
408 4,438,375

CLASS 318

78 4,438,376
254 4,438,377
280 4,438,378
685 4,438,379
696 4,438,380
4,438,381
744 4,438,382
799 4,438,383

CLASS 320

48 4,438,384

CLASS 322

28 4,438,385

CLASS 323

210 4,438,386
260 4,438,387
313 4,438,388

CLASS 324

52 4,438,389
71.1 4,438,390
4,438,391
79 R 4,438,392
83 D 4,438,393
126 4,438,394
127 4,438,395
4,438,396
133 4,438,403
158 P 4,438,397
173 4,438,398
220 4,438,399
312 4,438,400
326 4,438,401
452 4,438,402

CLASS 328

63 4,438,404
152 4,438,405
167 4,438,406

CLASS 329

50 4,438,407

CLASS 330

51 4,438,408
107 4,438,409
278 4,438,410
289 4,438,411

CLASS 331

2 4,438,412

CLASS 332

16 R 4,438,413

CLASS 333

28 T 4,438,414
81 A 4,438,415
160 4,438,416
193 4,438,417

CLASS 335

255 4,438,418
261 4,438,419
275 4,438,420

CLASS 336

65 4,438,421

CLASS 339

4 4,437,716
17 LC 4,437,717
61 M 4,437,718
91 R 4,437,719
95 D 4,437,720
97 P 4,437,721
4,437,722
99 R 4,437,723
143 R 4,437,724
156 R 4,437,725

252 P 4,437,726

CLASS 340

52 F 4,438,422
52 H 4,438,424
52 R 4,438,423
55 4,438,425
64 4,438,426
347 DD 4,438,427
521 4,438,428
539 4,438,429
547 4,438,430
663 4,438,431
825.35 4,438,432
825.44 4,438,433
825.51 4,438,434

CLASS 343

7.3 4,438,435
16 M 4,438,436
449 4,438,439
451 4,438,438
770 4,438,437

CLASS 346

75 4,438,440
140 R 4,438,441
153.1 4,438,442
4,438,443
155 4,438,444

CLASS 350

96.20 4,437,728
96.23 4,437,729
96.3 4,437,727
257 4,437,730
340 4,437,731
427 4,437,732
4,437,733
454 4,437,734
458 4,437,735
538 4,437,736

CLASS 351

237 4,437,737

CLASS 353

26 R 4,437,738
27 R 4,437,739

CLASS 354

21 4,437,742
117 4,437,745
126 4,437,747
132 4,437,748
155 4,437,750
214 4,437,749
4,437,751
289 4,437,752
293 4,437,753
402 4,437,743
442 4,437,744
476 4,437,740
479 4,437,741
4,437,746

CLASS 355

3 TR 4,437,754
10 4,437,755
14 R 4,437,756
15 4,437,757
41 4,437,758
91 4,437,759
133 4,437,760

CLASS 356

44 4,437,761
326 4,437,762
4,437,763

CLASS 357

14 4,438,445
17 4,438,446
19 4,438,447
23 4,438,448
41 4,438,449
68 4,438,450

CLASS 358

11 4,438,451
13 4,438,452
31 4,438,454
44 4,437,764
4,438,455
78 4,438,453
148 4,438,456
213 4,438,457
254 4,438,458
258 4,438,459
299 4,438,460
302 4,438,461

CLASS 360

2 4,438,462
10.2 4,438,463
13 4,438,464
22 4,438,465
66 4,438,466
77 4,438,467
92 4,438,468
109 4,438,469
113 4,438,470
125 4,438,471

CLASS 361

13 4,438,472
18 4,438,473
58 4,438,474
82 4,438,475
96 4,438,476
119 4,438,477
152 4,438,478
213 4,438,479
278 4,438,480
433 4,438,481

CLASS 362

103 4,438,482
183 4,438,483
267 4,438,484
268 B1 4,338,654

CLASS 363

21 4,438,485
56 4,438,486
129 4,438,487

CLASS 364

200 4,438,488
4,438,489
4,438,490
4,438,491
4,438,492
4,438,493
4,438,494
414 4,438,495
431.05 4,438,496
4,438,497
483 4,438,498
501 4,438,499
567 4,438,500
717 4,438,501
718 4,438,502
721 4,438,503
724 4,438,504
900 4,438,505
4,438,506
4,438,507

CLASS 365

122 4,438,508

CLASS 366

264 4,437,765
287 4,437,766
4,437,767

CLASS 367

156 4,438,509

CLASS 368

88 4,437,768
204 4,437,769
294 4,437,770

CLASS 369

271 4,438,510

CLASS 370

19 4,438,511

CLASS 371

60 4,438,512

CLASS 372

2 4,438,513
64 4,438,514
99 4,438,517

CLASS 373

39 4,438,518
88 4,438,515
97 4,438,516

CLASS 374

39 4,437,771
117 4,437,773
129 4,437,772

CLASS 375

1 4,438,519
4 4,438,520
16 4,438,521
27 4,438,522
30 4,438,523
80 4,438,524

CLASS 381

63 4,438,525
73 4,438,526
107 4,438,527

CLASS 384

92 4,437,774

CLASS 400

124 4,437,775
142 4,437,776
154.2 4,437,777
208 4,437,778
4,437,779
642 4,437,780

CLASS 402

8 4,437,781

CLASS 403

13 4,437,782
27 4,437,783
408 4,437,784

CLASS 404

64 4,437,785

CLASS 405

24 4,437,786
146 4,437,788
156 4,437,789
186 4,437,790
195 4,437,791
198 4,437,792
212 4,437,793
224 4,437,794
259 4,437,795

CLASS 406

25 4,437,796
110 4,437,797
119 4,437,798
198 4,437,799

CLASS 407

119 4,437,800

CLASS 408

197 4,437,802

CLASS 409

218 4,437,803
232 4,437,801

CLASS 411

59 4,437,804
361 4,437,805

CLASS 414

307 4,437,806
620 4,437,807
667 4,437,808

CLASS 415

41 4,437,809
115 4,437,810

CLASS 417

8 4,437,811
53 4,437,812
4,437,813
351 4,437,814
418 4,437,815
465 4,437,816
507 4,437,817

CLASS 418

9 4,437,818
26 4,437,819
55 4,437,820
104 4,437,821
122 4,437,822
219 4,437,823

CLASS 420

435 4,438,066

CLASS 422

56 4,438,067
61 4,438,068
62 4,438,069
70 4,438,070
109 4,438,071
133 4,438,072
135 4,438,073
4,438,074
189 4,438,075

CLASS 423

7 4,438,077
21.5 4,438,078
30 4,438,076
87 4,438,079
112 4,438,080
235 4,438,082
266 4,438,083
300 4,438,081
387 4,438,084
419 P 4,438,085
448 4,438,086
450 4,438,087
466 4,438,088
624 4,438,089

CLASS 424

7.1 4,438,090
21 4,438,091
28 4,438,139
50 4,438,093
59 4,438,094
61 4,438,140
70 4,438,095
4,438,096
88 4,438,097
89 4,438,098
93 4,438,099
104 4,438,100
114 4,438,101
130 4,438,102
177 4,438,103
4,438,104
180 4,438,105
4,438,106
4,438,107
4,438,109
183 4,438,108
217 4,438,110
244 4,438,112
246 4,438,111
4,438,113
248.51 4,438,114
4,438,141
250 4,438,115
4,438,116
251 4,438,117
4,438,118
4,438,119
256 4,438,120
258 4,438,121
260 4,438,142
263 4,438,122
269 4,438,125
270 4,438,123
4,438,124
272 4,438,126
4,438,127
273 N 4,438,128
273 P 4,438,092
273 R 4,438,129
274 4,438,130
278 4,438,131
285 4,438,132
300 4,438,133
4,438,134
4,438,135
304 4,438,143
309 4,438,136
319 4,438,144
330 4,438,137
4,438,138

CLASS 425

84 4,437,787
131.1 4,437,824
145 4,437,825
182 4,437,826
378 S 4,437,827
458 4,437,828

CLASS 426

92 B1 3,808,340
297 4,438,145
448 4,438,146
570 4,438,147
579 4,438,148
603 4,438,149
625 4,438,150

CLASS 427

36 4,438,151
37 4,438,152
4,438,153
39 4,438,154
49 4,438,155
57 4,438,156
93 4,438,157
101 4,438,158
162 4,438,159
214 4,438,160
215 4,438,161
318 4,438,162

CLASS 428

35 4,438,163
4,438,164
38 4,438,165
113 4,438,166
138 4,438,167
193 4,438,168
196 4,438,169
207 4,438,170
215 4,438,171
220 4,438,172
221 4,438,173
247 4,438,174
289 4,438,178
315.5 4,438,175
349 4,438,176
355 4,438,177
407 4,438,179
475.8 4,438,180
571 4,438,181

CLASS 429

91 4,438,182
111 4,438,183
181 4,438,184
250 4,438,185

CLASS 430

53 4,438,186
81 4,438,187
128 4,438,188
280 4,438,189
281 4,438,190
324 4,438,191
329 4,438,192
505 4,438,193
4,438,194
566 4,438,195

CLASS 431

21 4,437,829
54 4,437,830
177 4,437,831
304 4,437,832
329 4,437,833

CLASS 432

14 4,437,834
103 4,437,835

CLASS 433

199 4,437,836

CLASS 434

178 4,437,837
363 4,437,838
417 4,437,839

CLASS 435

96 4,438,196
119 4,438,197
178 4,438,198
190 4,438,199
193 4,438,200
228 4,438,201

CLASS 436

8 4,438,202
60 4,438,203
67 4,438,204
71 4,438,205
130 4,438,206
542 4,438,208
4,438,209
543 4,438,207

CLASS 440

27 4,437,840
42 4,437,841

CLASS 441

65 4,437,842
96 4,437,843

CLASS 445

5 4,437,844
39 4,437,845

CLASS 455

182 4,438,528
190 4,438,529
278 4,438,530

CLASS 464

36 4,437,846
74 4,437,847

CLASS 474

82 4,437,848
256 4,437,849

CLASS 493

89 4,437,850
124 4,437,851
216 4,437,852
302 4,437,853
353 4,437,854
424 4,437,855

CLASS 501

4 4,438,210
65 4,438,211
73 4,438,212
92 4,438,213
136 4,438,214

CLASS 502

71 4,438,215
101 4,438,216
169 4,438,019
205 4,438,217
220 4,438,218
333 4,438,219
341 4,438,021

CLASS 521

55 4,438,220
4,438,221
60 4,438,222
92 4,438,223
146 4,438,224
172 4,438,225
175 4,438,226
505— B1 3,579,540

CLASS 524

33 4,438,227
109 4,438,228
4,438,229
151 4,438,230
161 4,438,231
272 4,438,232
299 4,438,233
578 4,438,234
700 4,438,235

CLASS 525

54.1 4,438,239
165 4,438,236
183 4,438,237
240 4,438,238
420 4,438,240
444 4,438,241

CLASS 526

62 4,438,242
125 4,438,243
202 4,438,244
249 4,438,247
286 4,438,245
298 4,438,246

CLASS 528

57 4,438,248
61 4,438,249
66 4,438,250
73 4,438,251
75 4,438,252
86 4,438,253
89 4,438,254
176 4,438,255
188 4,438,256
347 4,438,257
361 4,438,258
388 4,438,259

CLASS 536

13.9 4,438,260
21 4,438,261
43 4,438,262
56 4,438,263
91 4,438,264

CLASS 544

29 4,438,265
309 4,438,267
315 4,438,268
350 4,438,266

CLASS 546

9 4,438,269
243 4,438,270
294 4,438,271

CLASS 548

308 4,438,272

CLASS 549

303 4,438,273
387 4,438,274
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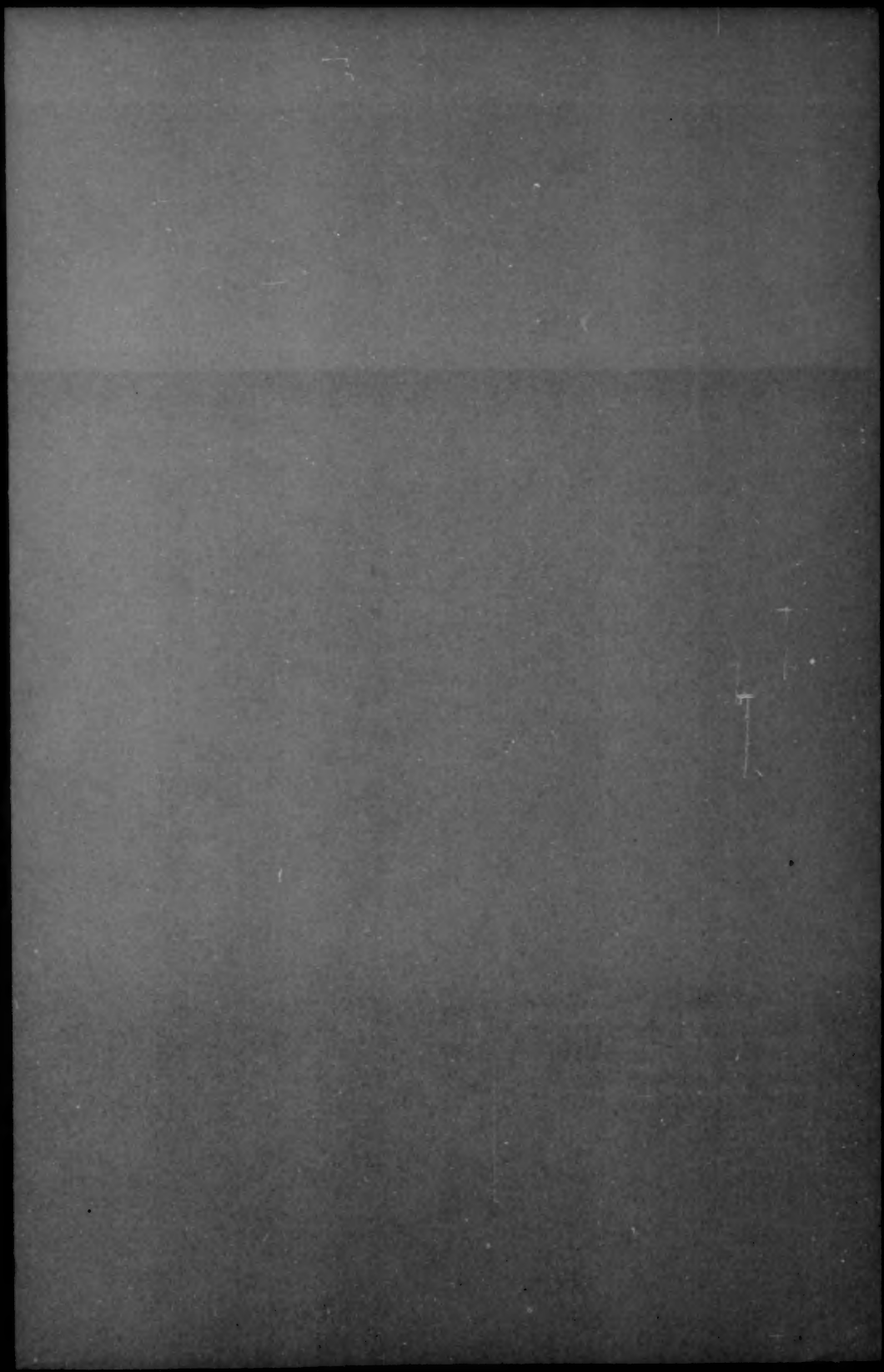
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